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MEDICINAL & AROMATIC PLANTS ABSTRACTS

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MEDICINAL & AROMATIC PLANTS ABSTRACTS

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VOLUME 14 NO.4 AUGUST 1992

Contents

Agronomy	341
Botany (General & Systematic)	344
Breeding & Genetics	348
Diseases & Pests	350
Physiology & Biochemistry	351
Pharmacognosy	358
Clinical Studies	360
Pharmacology & Toxicology	361
Antimicrobial Activity	385
Insecticidal & Piscicidal Activity	389
Phytochemistry	392
Chemotaxonomy	430
Ethnomedicine	432
Analytical & Processing Techniques	435
Miscellaneous	439
New Publications	443
Patents	444
List of Serials Abstracted	446
Botanical Names Index	449

Medicinal & Aromatic Plants Abstracts

Agronomy

9204-2062 Awad, A., Elshafie, S., Meawad, A., El Shaier, M. (Department of Horticulture, Faculty of Agriculture, Zagazig University, Egypt) **Effect of saline water irrigation on the growth, oil production, and chemical composition of sweet basil.** *7th Asian Symposium on Med. Plants, Spices, and Other Natural Prod. (ASOMPS VII). Manila*, 2-7 February 1992 (3 ref, Eng).

Sweet basil plants were irrigated with saline water (sea water) at different concentrations ranging from 0 to 4000 ppm. Salinity decreased growth parameter, but increased oil yield. At the same time, salinity decreased total N,P,K and chlorophyll percentage but total carbohydrate content was increased. Abstr. No. MP-27B.

9204-2063 Awad, A., El Shafie, S., Meawad, A., El Shaier, M. (Department of Horticulture, Faculty of Agriculture, Zagazig University, Egypt) **Gamma irradiation and CCC treatments reduced the harmful effects of salinity in sweet basil.** *7th Asian Symposium on Med. Plants, Spices, and Other Natural Prod. (ASOMPS VII). Manila*, 2-7 February 1992 (3 ref, Eng).

Sweet basil seeds were subjected to gamma irradiation (0-4 Krad). Seedlings were sprayed with CCC and grown under saline conditions. Subjecting the seeds to 1/2 or 1 Krad and spraying the seedlings with CCC enhanced plant growth in saline conditions. Oil yield and chemical composition were also improved. Abstr. No. MP-27A.

9204-2064 Balashanmugam, P.V. (Agricultural Research Station, Bhavanisagar 638451, TN, India) **Processing and curing of turmeric.** *South Indian Horticulture*, v. 39(4): p. 214-216, 1991 (3 ref, Eng).

Processing of turmeric by improved boiling technique using 0.1 percent sodium bicarbonate and by boiling in cowdung water in three varieties, BSR1, CO1 and Erode Local has been compared. Curing of turmeric by sodium carbonate method registered the highest recovery of processed rhizome than the conventional cowdung method. Among the varieties, BSR1 recorded the highest recovery of processed rhizomes than CO1 or Erode Local.

9204-2065 Bernath, J., Foldesi, D. (Research Institute for Medicinal Plants, 2011 Budakalasz, Hungary) **Sea buckthorn (*Hippophae rhamnoides* L.): A promising, new medicinal and food crop.** *Journal of Herbs, Spices & Medicinal Plants*, v. 1(1&2): p. 23-28, 1992 (11 ref, Eng).

Possible production of sea buckthorn, *H.rhamnoides*, in Hungary was investigated by field tests of selected cultivars and organoleptical tests of berries. Disease resistance, ease of harvest, chemical composition, and morphological habits of cultivars were studied in comparison to a wild population of sea buckthorn. The plant could be cultivated in Hungary and a 25 to 30ha field has been established. Since the plant is dioecious, male plants should be interplanted among a larger female population.

9204-2066 Bonnardeaux, J. (Western Australian Department of Agriculture, Kununurra, WA 6743, Australia) **The effect of different harvesting methods on the yield and quality of basil oil in the ord river irrigation area.** *Journal of Essential Oil Research*, v. 4(1): p. 65-69, 1992 (4 ref, Eng).

Essential oil from steam distilled whole plants of basil, *Ocimum basilicum*, harvested with different flower sizes was compared with oil produced from basil flowers only. Higher yields were obtained when distilling basil with long flower spikes (12 to 20 cm) than with shorter flower spikes. Distilling the whole plant gave an oil with a higher percentage of methyl chavicol whereas the flower spikes produced an oil rich in linalool.

9204-2067 Chaghtai, S.M., Ibrar, M., Ali, Q. (Department of Botany, Islamia College, University of Peshawar, Peshawar, Pakistan) **Some antecological observations on *Catharanthus roseus* (L.) G. Don.** *Pakistan Journal of Botany*, v. 23(2): p. 249-256, 1991 (28 ref, Eng).

Germination and growth of *C. roseus* were found directly related to temperature in laboratory experiments. Scarification of seeds retarded germination and growth of seedlings. Seeds soaked in water at 30 degree C for 2h significantly increased incubation period. Loam soil gave maximum germination and growth. Partial sunlight and complete shade adversely affected germination and growth.

9204-2068 Douglas, D.W., Thomas, A.G., Peschken, D.P., Bowes, G.G., Derksen, D.A. (Department of Crop Science and Plant Ecology, University of Saskatchewan, Saskatchewan, Canada S7N 0WO) **Effects of summer and winter annual scentless chamomile (*Matricaria perforata* Merat) interference on spring wheat yield.** *Canadian Journal of Plant Science*, v. 71(3): p. 841-850, 1991 (23 ref, Eng, Fre).

In experimental plots, spring wheat was seeded into barley stubble where summer and winter annual scentless chamomile *M.perforata* had been established. A rectangular hyperbolic model was used to describe the relationship

between wheat yield and the density of flowering scentless chamomile plants. Winter annuals caused more yield reduction than did summer annuals. Weather conditions appeared to have an influence on the effect of scentless chamomile on spring wheat yield. The same model was fitted to sample data from farmers' fields and showed yield losses similar to those on experimental plots. The rectangular hyperbolic model fitted the data best when high weed densities occurred. At densities more typical of those found in farm fields, the asymptotic yield loss parameter of the model was poorly estimated.

9204-2069 Galambosi, B., Szebeni-Galambosi, Z. (Agricultural Research Centre, South Savo Research Station, Karila 50600 Mikkeli, Finland) **The effect of nitrogen fertilization and leaf-harvest on the root and leaf yield of lovage.** *Journal of Herbs, Spices & Medicinal Plants*, v. 1(1&2): p. 7-13, 1992 (10 ref, Eng).

The effect of various amounts of nitrogen fertilizer (0, 15, 30, 45, 75, 120 kg/ha N) and the number of leaf harvests on the quality and quantity of lovage (*Levisticum officinale*) was studied in a two-year-old stand in Puumala south-Finland in 1987. As nitrogen fertilization increased fresh root yield increased from 115 to 213 kg/100 m². The optimum N-level however seems to be between 45 to 75 kg/ha due to the increase of nitrate content in the dry roots. The experiment also demonstrated that harvesting of leaves and roots from the same cultivation is not practical. One cutting of the above ground parts of the plants at the beginning of the flowering (July 30) decreased the root yield by 22 to 48 percent and two cuttings (June 15 July 30) decreased the root yield by 53 to 73 percent relative to plants that had no leaf harvest. The consistency and the aroma content of the roots from plants where vegetative parts had been harvested were also of lower quality. Separate cultivations should be used for vegetative and root production to ensure good quality.

9204-2070 Gasic, O., Mimica-Dukic, N., Adamovic, D. (Institute of Chemistry, Faculty of Sciences, University of Novi Sad, Trg D. Obradovica 3 21000 Novi Sad, Yugoslavia) **Variability of content and composition of essential oil of different *Mentha arvensis* L. var. *piperascens* cultivars.** *Journal of Essential Oil Research*, v. 4(1): p. 49-56, 1992 (17 ref, Eng).

The essential oil content and composition of seven *M. arvensis* var. *piperascens* cultivars were investigated over three years. The parameters varied both in relation to environmental factors, harvest time and genotype examined. The cultivars showed specific responses to environmental conditions. Four cultivars were selected for further work because of their similarity to commercial cornmint.

9204-2071 Korikanthimath, V.S., Peter, K.V. (NRCS, Cardamom Research Centre, Appangalan, Haravanad Post, Madikeri - 571201, Karnataka) **Coffee based pepper cropping system.** *Indian Coffee*, v. 56(5): p.3-11, 1992 (Eng).

Cultivation of pepper (*Piper nigrum*) as a mixed crop especially with coffee has been suggested in order to improve annual and perennial crop, and also to sustain high income from the available land and provide employment to agricultural labourers. The cultivation practices for coffee and pepper, their diseases and pests and their control measures have been described. The cost statistics have been discussed.

9204-2072 Krannitz, P.G., Maun, M.A. (Department of Plant Sciences, University of Western Ontario, London, Ont., Canada N6A 5B7) **An experimental study of floral display size and reproductive success in *Viburnum opulus*: Importance of grouping.** *Canadian Journal of Botany*, v. 69(2): p. 394-399, 1991 (29 ref, Eng).

Two components of the floral display of *V. opulus* were manipulated to determine their effect on fruit initiation and maturation. The size of the floral display was altered by planting individual shrubs in groups of 1,5 or 10 in 1985 and in groups of 2 or 6 in 1986. Inflorescence size was changed by altering the number of sterile accessory flowers per inflorescence: 0,4, or untreated in 1985 and 0 or untreated in 1986. The sterile-flower treatment did not explain a significant proportion of the variation in fruit initiation or maturation. In contrast, the plant-grouping treatment was significant in 1985 but not in 1986. The number and proportion of fruits initiated were higher in larger groups of plants than in small groups. The proportion of fruits initiated in group sizes 1,5 and 10 was 6.9, 15.0, and 22.7 percent per plant, respectively, and 4.3,9.1, and 19.4 percent per inflorescence, respectively. The larger groups did not initiate or mature proportionally more fruits in 1986. Within the plant-grouping treatment fruit initiation and maturation were always significantly correlated with flower number in both 1985 and 1986.

9204-2073 Murugesan, S., Thamburaj, S., Rajamani, K. (Horticultural Research Station, Yercaud 636602, TN, India) **Performance of rose cultivars at Yercaud.** *South Indian Horticulture*, v. 39(6): p. 359-362, 1991 (6 ref, Eng).

The co-efficient of variation of 85 rose cultivars studied was found to be very high for number of flowers per plant (137 percent) followed by the number of thorns per 10 cm length of stem (55.6 percent), plant height (34.8 percent), flower diameter (25.9 percent) and stalk length (2.59

percent). Cultivars suitable for quality, garden decoration, colour spectrum and fragrance have been recommended.

9204-2074 Ndamba, J., Chandiwana, S.K. , Kayanda, C.(Blair Research Laboratory, Box 8105, Causeway, Harare, Zimbabwe) **Factors influencing the natural distribution of *Phytolacca dodecandra* (L,Herit) plants in Zimbabwe.** *Zimbabwe Science News*, v. 25(7/9): p. 59-61, 1991 (10 ref, Eng).

Study of natural distribution of *P.dodecandra* plants in Zimbabwe has shown that these plants are most likely to be found in those areas which are above 900 meters above sea level and whose soil types are either ortho or para ferrallitic. *P.dodecandra* plants have been planted in all regions of the country at various altitudes under different soil types in order to determine what exactly influences the natural distribution of this plant in Zimbabwe.

9204-2075 Omer, E.A., Refaat, A.M., Ahmed, S.S., Kamel, A., Embaby, S.E., Hammouda, F.M.(Pharmaceutical Sciences Department, National Research Centre, Dokki, Cairo, Egypt) **Effect of spacing and fertilization on the yield and active constituents of *Silybum marianum* (L.).** *7th Asian Symposium on Med. Plants. Spices, and Other Natural Prod. (ASOMPS VII)*. Manila, 2-7 February 1992 (3 ref, Eng).

The effect of spacing and/or nitrogen and potassium fertilization on the seed yield, oil and flavanolignan contents of *S.marianum* seeds has been studied. The under investigation treatments included the combinations between two plant spacing (25 and 50 cm. between two hills), two nitrogen doses (30 and 60 kg.N/feddan) and three potassium doses (24,36 and 48 kg. K2O/fed.). The qualitative and quantitative determination of flavanolignans, silybin, silydianian and silychristin were carried out by HPLC. The results revealed that the narrower spacing (25 cm.) gave higher yield of seeds, less oil percent and less percent of flavanolignans, higher amounts of oil and flavanolignans. Increasing nitrogen fertilization slightly increased oil percent and increased seed yield, oil yield and flavanolignans content. Increasing potassium fertilization up to 60 kg.K2 O/fed. slightly increased oil percent and increased seed yield, oil content and flavanolignan content. *Abstr.No. MO-28.*

9204-2076 Pandey, N.K.(Amalgamated Units, CCRAS, Tarikhet, 263663, UP, India) **Drug potential and conservation notion of medicinal plants of western Himalaya.** *Journal of Research and Education in Indian Medicine*, v. 10(3): p. 29-40, 1991 (8 ref, Eng).

Western Himalayas is endowed with phytogeographical variation and yields about 65-70 percent of herbal drugs.

231 Medicinal plants have been enumerated. The environmental conservation of this zone is discussed. An ecology development programme has been discussed, aimed at restoring ecosystem through management strategy i.e. plan to compartmentalization of the landscape so as to simultaneously maintain its high productivity..

9204-2077 Parthiban, S., Abdul Khader, M.(Horticultural College and Research Institute, Coimbatore 641003, TN, India) **Effect of N, P and K on yield components and yield in tuberose.** *South Indian Horticulture*, v. 39(6): p. 363-367, 1991 (1 ref, Eng).

Application of 100, 75 and 62.5 kg NPK/ha in *Polianthes tuberosa* cv 'Single', recorded the maximum number of spikes per plant (1.72), maximum number of flowers per spike (39.67) and maximum flower yield of 3578.6 kg/ha.

9204-2078 Quintana, E.G., Deseo, M.A., Medina, S.M.(Department of Horticulture, College of Agriculture, University of the Philippines at Los Banos College, Laguna, Philippines) **Harvesting and postharvest handling studies on medicinal plants *Vitex negundo* L. (Lagundi).** *7th Asian Symposium on Med. Plants, Spices, and Other Natural Prod. (ASOMPS VII)*. Manila, 2-7 February 1992 (Eng).

Various harvesting and postharvest handling treatments were studied to determine their effects on the volatile oil content of *V.negundo* leaves. The different treatments were season (dry and wet), age of plant (three and six months old), drying method (air-sun-and oven-drying), stage of plant growth and development (flowering and non-flowering), leaf maturity (mature and young) and drying (fresh and dried). Results show that volatile oil content of *V.negundo* is not affected by season, age of plant, leaf maturity and drying. The stage of plant development and drying method on the other hand significantly affect the volatile oil content. Volatile oil yield is higher for flowering plants (0.3275 percent) and air-dried leaves (0.33 percent) than for non-flowering plants (0.2167 percent) and sun (0.213 percent) or oven-dried (0.273 percent) leaves, respectively. It is therefore recommended that *V.negundo* be harvested for volatile oil anytime of the year as early as three months from planting of cuttings. Leaves to be harvested can be either young or mature, fresh or air-dried without any difference in volatile oil content. *Abstr.No. Mo-21.*

9204-2079 Radhakrishnan, V.V., Viswanathan, T.V. , Cherian, S., Reghunath, B.R.(College of Horticulture, Vellanikkara 680654, Trichur, TN, India) **Shade tolerance studies on patchouli (*Pogostemon patchouli*).** *South Indian Horticulture*, v. 39(6): p. 388-389, 1991 (2 ref, Eng).

Herbage yield was significantly low under open condition (2027 kg/ha) while it was 3578 kg/ha and 4243 kg/ha under 25 percent and 50 percent shade conditions respectively. The highest oil yield was from the plants under 50 percent shade (172.82 kg/ha) followed by 25 percent shade (117.78 kg/ha) and the least from the open condition. Shade and varieties showed significant interaction with respect to oil yield/ha.

9204-2080 Simon, J.E., Bubenheim, D.R., Joly, R.J., Charles, D.J. (Department of Horticulture, Purdue University, West Lafayette, IN 47907, USA) **Water stress-induced alterations in essential oil content and composition of sweet basil.** *Journal of Essential Oil Research*, v. 4(1): p. 71-75, 1992 (15 ref, Eng).

Mild and moderate plant water stress increased sweet basil leaf essential oil content and altered oil composition. After 21 d of plant water deficit, the oil content of leaves increased from 3.1 to 6.2 micro l/g leaf dry wt. as xylem water potential decreased from 0.30 to 1.12 MPa. Significant decreases in leaf dry weight and stem dry weight were observed as plant water deficit increased. Only leaf area plants subjected to a mild water deficit (-0.68 MPa) was not significantly reduced compared to the control, non-stressed plants. Water stress altered the oil composition (both as a relative percentage of total oil and micro l/g leaf dry weight). Linalool and methyl chavicol increased as water stress increased while the relative proportion of sesquiterpenes decreased.

9204-2081 Thomas, P.P., Gopalakrishnan, N. (Regional Research Laboratory, CSIR, Thiruvananthapuram 695019, Kerala, India) **Green colour retention in enzyme inactivated dried pepper.** *Indian Spices*, v. 28(1): p. 6-10, 1991 (10 ref, Eng).

Retention of green colour in dried *Piper nigrum* by three methods of polyphenol oxidase enzyme inactivation obtained in different time durations varied for direct microwave exposure, microwave exposed boiling water blanching and boiling water blanching. However, combined microwave exposure in boiling water method gave uniformly green coloured pepper at the shorter time than that without microwave exposure in boiling water.

9204-2082 Tomar, S.S., Nigam, K.B., Pachori, R.S., Kahar, L.S.* (College of Agriculture, Jawaharlal Nehru Krishi Vishwa Vidyalaya, Mandsaur 458001 MP, India) **Irrigation schedule based on irrigation water: Cumulative pan evaporation in opium poppy (*Papaver somniferum*)**. *Indian Journal of Agricultural Sciences*, v. 62(5): p. 313-315, 1992 (4 ref, Eng).

During 1989-90 and 1990-91 a field experiment was conducted with 7 irrigation schedules, (irrigation water: cumulative pan evaporation ratios 0.4, 0.6, 0.8, 1.0, 1.2, 1.4 and irrigation at all physiological stages (traditional method) in 'Jawahar Aphim 16' opium poppy *Papaver somniferum*). An IW: CPE ratio 1.0 proved superior to that of 0.4, 0.6 and 0.8, giving 20.8, 15.0 and 16.4 percent higher yield of latex, seed and capsule husk respectively compared with the traditional method. Leaf-area index, capsule size and number of effective lancing also increased upto an IW: CPE ratio of 1.0.

Botany (General & Systematic)

9204-2083 Abedin, S., Al-Yahya, M.A., Chaudhary, S.A., Mossa, J.S. (Department of Pharmacognosy and Research Centre for Medicine, Aromatic and Poisonous Plants, College of Pharmacy, King Saud University, P.O.Box 2457, Riyadh 11451, Saudi Arabia) **Contribution to the flora of Saudi Arabia Part II. a revision of the family solanaceae.** *Pakistan Journal of Botany*, v. 23(2): p. 257-282, 1991 (48 ref, Eng).

The family Solanaceae in the kingdom of Saudi Arabia, represented by 43 taxa distributed in 11 genera (including 12 cultivated species) has been revised. Two new status of *Solanum incanum* var. *unguiculatum* and *Withania somnifera* subsp. *obtusifolia* has been suggested and five taxa recorded for the first time. Key to genera, species, their description and geographical distribution are also given.

9204-2084 Chattopadhyay, S., Ray, M., Datta, S.K. (Department of Botany, Visva-Bharati, Santiniketan 731235, WB, India) **Cytochemical changes during somatic embryogenesis of *Tylophora indica* (Olerr.).** *Journal Mendel*, v. 9(1): p. 61-62, 1992 (15 ref, Eng).

Callus tissues, derived from nodal explants have been taken for the present study. During establishment of embryogenesis, found the role of NAA alone on embryo induction and rooting. Cytochemical studies showed the presence of starch, protein, succinate dehydrogenase, and flavonoids and their metabolism during somatic embryogenesis. NSL, New Delhi.

9204-2085 Clery, R.A., Ross, J.D. (Botany Department, School of Plant Sciences University of Reading, Whiteknights, Reading, Berks, RG6 2AS United Kingdom) **An improved technique for recording the occurrence of essential oil glands.** *Journal of Essential Oil Research*, v. 4(1): p. 61-64, 1992 (4 ref, Eng).

An improved technique is described for producing an actual and permanent record of the number and distribution of essential oil glands on the surface of leaves. A fresh leaf

is pressed into thermal printer paper in order to rupture the oil glands which then leave an image as black dots on the paper. This rapid and inexpensive technique is suitable for both laboratory and field usage.

9204-2086 Gideon, O.(Papua New Guinea Forest Research Institute, Papua New Guinea) **Costoideae or Costaceae: A taxonomic rank controversy.** *Zingiberaceae Workshop, Prince of Shongkla University, Hat Yai, Thailand*, p. 20, 15-18 Oct. 1991 (Eng).

The taxonomic position of the natural group comprising *Costus*, *Dimerocostus*, *Monocostus* and *Tapeinocchilos* has been reviewed. Information on morphological and anatomical features have been scanned and a discussion on proper taxonomic position of this group, indisputably one of the most natural members of the order Zingiberales has been given. Its relationship with Zingiberaceae (sens. lat.) and other members of the order has been discussed. An explanation has also been given for the preferred taxonomic rank for the *Costus* group..

9204-2087 Huh, H., Staba, E.J.(Department of Medicinal Chemistry, College of Pharmacy, University of Minnesota, Minneapolis, MN 55455, USA) **The botany and chemistry of *Ginkgo biloba* L..** *Journal of Herbs, Spices & Medicinal Plants*, v.1(1&2): p. 67-90, 1992 (141 ref, Eng).

G.biloba, tree indigenous to China, is a promising drug plant which has a long history of being used for medicinal purposes. The present review has been focussed on the botanical characteristics and reproductive process so that a rationale for developing in vitro systems for both micropropagation and the production of bioactive compounds might be developed.

9204-2088 Hussain, K.H. , Ibrahim, H.(National University of Malaysia, Malaysia) **Anatomical and morphological variation in *Elettariopsis* spp..** *Zingiberaceae Workshop, Prince of Songkla University, Hat Yai, Thailand*, p. 14-15, 15-18 Oct. 1991 (Eng).

Comparative anatomical and morphological studies on *Elettariopsis curtisii*, *E.smithiae* var. *rugosa* and several variants of *E.triloba* were undertaken. The species were relatively well differentiated by their vegetative and floral morphology. The different vegetative characters of variants of *E.triloba* were morphologically different. Leaf anatomy showed variation between the three species and also between the variants of *E.triloba*. The shape of the leaves and petioles in transverse sections and the presence of medullary bundles and fibre bundles could be used to distinguish the different species and variants.

9204-2089 Ibrahim, H.(University of Malaya, Malaysia) **The biodiversity and current status of research on Zingiberaceae of Malaysia.** *Zingiberaceae Workshop, Prince of Songkla University, Hat Yai, Thailand*, p. 2, 15-18 Oct. 1991 (Eng).

The biodiversity of Malaysian Zingiberaceae in relation to their taxonomy, distribution, ecology and conservation has been discussed. In view of the family's great potential for development as commodity crops, there is a need to identify priority areas for developing multidisciplinary research programs. Progress of on-going work and plans for future research themes have been highlighted.

9204-2090 Ibrahim, H., Jones, D.T., Ali, M. , Zaharah, T. (Department of Botany, Faculty of Science, University of Malaya 59100, Kuala Lumpur MARDI, Serdang, Selangor) **Taxonomic studies on some selected species of Aurantioideae.** *7th Asian Symposium on Med. Plants, Spices and Other Natural Prod. (ASOMPS VII).* Manila, 2-7 February 1992 (Eng).

The relationship between *Citrus madurensis* with two other species of *Citrus* namely *C.aurantifolia* *C. reticulata* and two species of *Fortunella* namely *F.margarita* and *F.polyandra* is discussed. A total of 158 morphological characters were analysed numerically, and isozyme variation of peroxidase enzyme was also screened for the five species studied. Results indicate that *Citrus madurensis* may be more closely allied with *Fortunella* rather than with *Citrus*. (Abstr.No. WB-7).

9204-2091 Jain, S.K.(National Botanical Research Institute, Lucknow, UP, India) **Zingiberaceae in India: Phytogeography and endemism.** *Zingiberaceae Workshop, Prince of Songkla University, Hat Yai, Thailand*, p. 4-5, 15-18 Oct. 1991 (Eng).

Two monotypic genera, viz., *Paracauleya* and *Parakaempferia*, are endemic to India. Thirty four species of Zingiberaceae are confined to northeastern India and eastern Himalaya. Another five endemics occur here, but extend to other parts of India. The largest number of endemics in this region are *Hedychium* (14 taxa) and *Zingiber* (4 taxa). There is low endemism in the northwestern and central Himalaya and in the plants of northern India. *Cauleya petiolata* is confined to the western Himalaya, other endemics occurring in this region extend to other parts of India.

9204-2092 Jones, D.T.(Department of Botany, University of Malaya 59100 Kuala Lumpur, Malaysia) **The Rutaceae-Aurantioideae of southeast Asia: A taxonomic update.** *7th Asian Symposium on Med. Plants, Spices, and Other*

Natural Prod.(ASOMPS VII). Manila, 2-7 February 1992
(Eng).

New taxonomic information has come to light in recent years to warrant an update of the subfamily Auranthioideae. From Southeast Asia alone, 19 new species have been described. Studies in various fields such as morphology, chemistry, palynology, cytogenetics and numerical taxonomy have contributed to an improved understanding of taxonomic relationships for some genera and species. Nomenclatural changes and extensions of geographical ranges for some taxa are also reported. A computer-assisted herbarium information system and field genebank for wild citrus species from Southeast Asia are maintained by the Department of Botany, University of Malaya to aid taxonomists, breeders, conservationists and germplasm collectors. The database currently houses ecogeographical information on over 1500 records of wild citrus from Southeast Asia, the field genebank manages over 150 accessions of predominantly wild citrus taxa, the majority of which are native to the region. (Abstr. No. WB-5).

9204-2093 Larsen, K.(Univesity of Aarhus, Denmark) **Overview of the Zingiberaceae of Thailand.** *Zingiberaceae Workshop, Prince of Sangkla University, Hat Yai, Thailand*, p. 1, 15-18 Oct. 1991 (Eng).

The taxonomic studies including morphology, cytology and palynology have given new information and a better understanding of variability. More than 200 species have been recorded from Thailand and several new species have been described. The taxonomic problems have been discussed and a general overview of the biodiversity of the Zingiberaceae has been demonstrated.

9204-2094 Latiff, A., Pordi, M.M., Rahman, A.A.(Botany Department, University Kebangsaan Malaysia) **Anatomy of Zingiber, Etlingera and Costus.** *Zingiberaceae Workshop, Prince of Songkla University Hat Yai, Thailand*, p. 13-14, 15-18 Oct. 1991 (Eng).

Anatomical studies were carried out on ten species of *Zingiber* three species of *Etlingera* and four species of *Costus*. Cross sections of leaf mid-rib and petioles showed some distinct infra and intergeneric similarities and differences. The form and arrangement of open vascular bundles were similar in all species. The bundle sheaths of *Etlingera* are composed of sclerenchyma whereas those of *Zingiber* and *Costus* are of collenchyma. Druses were observed in *Costus* and calcium oxalates were observed in *Zingiber* and *Etlingera*. The taxonomic value of these characters have been discussed.

9204-2095 Madulid, D.(National Museum, The Philippines) **An overview of Philippine Zingiberaceae.**

Zingiberaceae Workshop, Prince of Songkla University, Hat Yai, Thailand, p. 8, 15-18 Oct. 1991 (Eng).

There are 15 genera and 103 species of Zingiberaceae recorded in the Philippines. Of these two genera are monotypic and endemic to the country (i.e. *Leptosalena* and *Vanoverberghia*). Eighty five percent of the total species are endemic. Most of the endemic taxa are found in primary forests or regenerating forests where the soil is damp or in gullies and deep ravines. The various species of Zingiberaceae are spread throughout the country from sea level to more than 1,000m altitude (e.g. *Amomum pandanicarpum* and *A. pubimarginatum*). Most of the species are terrestrial but a few species are epiphytic (e.g. *Hedychium philippinense*).

9204-2096 Maiti, S., Biswas, S.R.(Indian Institute of Horticultural Research, Bangalore, Karnataka 560089, India) **Leaf-area estimation in betelvine (Piper betle).** *Indian Journal of Agricultural Sciences*, v. 62(5): p. 349-350, 1992 (1 ref, Eng).

Actual leaf area was measured with the help of automatic leaf-area meter. The regression equations, which had the coefficient of determination more than 70 percent have been enlisted. The degree of association between the estimated leaf area calculated by the formula and the actual leaf area, a simple correlation coefficient between them was also worked out.

9204-2097 Mangary, J.K., Hamsa, P.V.(University of Calicut, Kerala, India) **Placentation in Zingiberaceae.** *Zingiberaceae Workshop, Prince of Songkla University, Hat Yai, Thailand*, p. 15, 15-18 Oct. 1991 (Eng).

Structural and developmental studies indicate that placentation in Zingiberaceae is parietal. Among the four species studied *Alpinia calcarata*, *Amomum pterocarpum*, *Globba marantina* and *Zingiber officinale*, the ventral and dorsal vascular bundles of the ovary are in different radii and the ventral bundles are normally oriented with relation to xylem and phloem. In *Z. officinale*, each ventral bundle directly, and in others the ventral bundle from its branch, the placental bundle, provides vascular strands to ovules on the continuous margins of adjacent carpels. Developmental studies in *A. calcarata* show that the placentae intrude into the ovary chamber and fuse at the lower portion of the ovary, leaving the upper portion of the ovary chambers confluent.

9204-2098 Mizukami, H., Matsunaga, K., Ohashi, H., Amano, A., Maekawa, T., Fujimoto, K(Faculty of Pharmaceutical Sciences, Nagasaki University, Bunkyo-machi 1-14, Nagasaki 852, Japan) **Variation in Saikosaponin content of Bupleurum falcatum L. of different**

geographic origins. *Shoyakugaku Zasshi*, v. 45(4): p. 342-344, 1991 (7 ref, Eng).

The seeds of *B. falcatum* were collected at seven different habitats in Japan and cultivated repeatedly. The saikosaponin contents in the roots of the plants from Itoda and Yufuin were always higher than that of the plant from Hiraodai, the saikosaponin content of which was, in turn, were higher than those of the plants from Mishima, Akiyoshidai, Aso and Kirishima. These results indicate that *B. falcatum* plants distributed in Japan are polymorphic with respect to the saikosaponin content of the roots.

9204-2099 Murata, H., Uchiyama, H., Motomura, M., Fujiwara, M., Inada, A., Nakanishi, T., Murata, J. (Faculty of Pharmaceutical Sciences, Setsunan University, 45-1, Nagatoge-machi, Hirakata, Osaka, 573-01, Japan) Variation of sex expression and flower structure in a population of *Eurya japonica* Thunb.. *Journal of Japanese Botany*, v. 66(4): p. 229-234, 1991 (8 ref, Jap, Eng).

Sex expression and flower structure were examined for a population of *E. japonica* in Osaka Prefecture, Western Honshu. Male, female and monoecious plants were found within one population. On the monoecious individuals, male, female and hermaphrodite flowers occur mixed together in various ways. The number of stamens per flower varies from 1 to 15 but ranges from 8 to 15 in male individuals. The flower colour and shape vary from pale green to reddish purple and cylindrical to widely campanulate, respectively.

9204-2100 Rajbhandari, K.R. (National Herbarium & Plant Laboratories, Nepal) *Zingiberaceae of Nepal: taxonomy and distribution*. *Zingiberaceae Workshop, Prince of Songkla University, Hat Yai, Thailand*, p. 7, 15-18 Oct. 1991 (Eng).

Zingiberaceae is represented by 11 genera and 35 species in Nepal; most of them are tropical and subtropical in distribution. Species of *Cautleya*, *Hedychium* and *Roscoea* occur from the temperate to the subalpine region. The largest genus is *Hedychium* having 10 species but most of these are cultivated for ornamental purposes. *Roscoea* is the only genus having three endemic species which have very narrow distribution in Nepal. Besides distribution the taxonomic problems of the Nepalese species of *Cautleya*, *Globba* and *Roscoea* have been discussed based on gross morphological characters. (Abstr. No. 1545-1615).

9204-2101 Shilin, H. (Institute of Chinese Materia Medica, China Academy of Traditional Chinese Medicine, 18 Beixincang, Beijing 100700, The People's Republic of China) Making herbarium specimens with a new

method of ultrasonic processing. *Journal of Herbs, Spices & Medicinal Plants*, v. 1(1&2): p. 51-53, 1992 (2 ref, Eng).

A new ultrasonic technique for processing specimens from fresh plants has been developed. The technique is especially suitable for preparing specimens that are fleshy and succulent and specimens that have waxy surfaces, such as the leaves and stems of *Artemisia annua*. In addition, the problems of tissue separation observed in some specimens during the pressing procedure do not occur with ultrasonic processing technique.

9204-2102 Sirirugsa, P. (Prince of Songkla University, Thailand) The tribe *Hedychieae* in Thailand. *Zingiberaceae Workshop, Prince of Songkla University, Hat Yai, Thailand*, p. 1-2, 15-18 Oct. 1991 (Eng).

Thirteen species of *Bosenbergia*, fifteen species of *Kampferia*, nineteen of *Hedychium* and two species of *Scaphochlamys* of tribe *Hedychieae* have been recognised. The distinct morphological characteristics as well as the variation and distribution of selected species has been discussed and illustrated.

9204-2103 Srivastava, S.K.. *Zingiberaceae of the Andaman and Nicobar Islands*. *Zingiberaceae Workshop, Prince of Songkla University, Hat Yai, Thailand*, p. 6-7, 15-18 Oct, 1991 (Eng).

In the Andaman and Nicobar group of islands, there are about 11 genera and 21 species, of these, 5 are endemic to India and are confined to these islands. The majority of the Andaman and Nicobar species are more widespread in the Indomalaysian region. The genera known to occur in Andaman & Nicobar Islands are *Alpinia* Roxb. (3 spp.), *Amomum* (2 spp.); *Boesenbergia* (2 spp.); *Costus* (1 sp.); *Curcuma* (4 spp.); *Globba* (3 spp.); *Hedychium* (1 sp.); *Hornstedtia* (1 sp.); *Kaempferia* (1 sp.) and *Zingiber* (4 spp.).

9204-2104 Wood, T.H.. *Biogeography and the evolution of the Zingiberaceae*. *Zingiberaceae Workshop, Prince of Songkla University, Hat Yai, Thailand*, p. 19, 15-18 Oct. 1991 (Eng).

The present day distribution of taxonomic divisions of the Zingiberaceae, together with a knowledge of plate tectonics, provides information that allows a tentative phylogeny of the family. The constoideae and the tribe *Alpineae* are the most primitive groups in the family which had their origin before South America and Africa had separated 70 million years ago. The tribe *Hedychieae* is the next most ancient division, probably originating after the Indian subcontinent separated from Africa. The tribe *Globbeae* and *Zingibereae* are more recent in their evolution.

9204-2105 Wu, Te-Lin. **The plant geography of Chinese Zingiberaceae.** *Zingiberaceae Workshop, Prince of Songkla University, Hat Yai, Thailand*, p. 3-4, 15-18 Oct. 1991 (Eng).

The history, classification, geography and origin of Chinese Zingiberaceae has been discussed.

Breeding & Genetics

9204-2106 Ahmad Abd Rahman(University Pertanian Malaysia, Malaysia) **Germplasm collection of Zingiberaceae in university Pertanian, Malaysia.** *Zingiberaceae Workshop, Prince of Songkla University, Hat Yai, Thailand*, p. 22, 15-18 Oct. 1991 (Eng).

In Peninsular Malaysia about 22 genera and nearly 200 species of Zingiberaceae have been identified. For conservation purpose, a "Zingiberium" has been developed at the Department of Biology, University Pertanian Malaysia. A few expeditions have been conducted to collect the species in some parts of Peninsular Malaysia. All the species have been planted and identified. To date about 120 species have been collected. The chemical constituents of these species have also been studied.

9204-2107 Aida, R., Takaiwa, F., Imai, T., Ishige, T.(National Institute of Agrobiological Resources, Tsukuba 305, Japan) **Analysis of distribution and diversity of patatin promoters in Solanum species by using the polymerase chain reaction technique.** *Japanese Journal of Breeding*, v. 41(3): p. 511-515, 1991 (5 ref, Eng).

The promotor region of the B33 gene, one of the class I patatin genes, was cloned for use as a probe for Southern blotting. All the lines used in this experiment even the no-tuber-bearing wild species, exhibited a homologous sequence to the class I patatin promotor region which controls the tuber-specific expression. The fragment pattern of amplified DNA varied with the lines length of the fragments with patatin promotor homologous sequences was not uniform. *Solanum nigrum*, *S.photeinocarpum*, *S.bulbocastanum* and *Solanum peruvianum* showed faint bands or lacked bands in the electrophoretic analysis. IARI, New Delhi.

9204-2108 Al-Kordy, M.A., El-Ballal, A.S.* , Al-Saudi, A.A., Hassanion, A.H., Hanna, A.G.(Department Natural Products NRC, Dokki, 12311, Cairo, Egypt) **Selection for yield and chromones quality in khella (Ammi visnaga L.).III. Allelopathic expressions and chemotypes X environmental interaction.** *7th Asian Symposium on Med. Plants, Spices, and Other Natural Prod. (ASOMPS VII)*. Manila, 2-7 February 1992 (Eng).

Phenolic compounds isolated from the genus *Ammi* were termed as "Kolines" and have particulate allelopathic expressions. Therefore, a selection procedure stressed on dense culture and acceleration of heat shock genes in a big crude population of Egyptian *A.visnaga* had resulted in interesting variations in chemotypes with characteristic behaviors in genotype X environmental interaction. As a result, a wide range of total chromones from 0.29-4.17 percent with a close genetic determination (*h_{2b}* was 0.9909) was obtained. A high content strains of coumarins and chromones could be obtained one at the cost of the other. In this view, the strain No. 46 had 0.07 percent khellin and visnagin against 0.17 percent coumarins, contrary to the strain No. 111 that had a content of 1.83 percent coumarins but 0.06 percent khellin and visnagin. The most interesting result is that the qualitative variation in individual coumarins and /or chromones were relevant to simple genetic controls. The screened probabilities on DLC technique had resulted in characteristic 26 chemotypes. The genetic controls of coumarin and chromones could be declared through crossing or protoplast fusion techniques. Abstr. No. MO-27.

9204-2109 Al-Kordy, M.A.A., Al-Desouky, R.A.I., El-Ballal, A.S.I., Al-Suadi, A.A., Hassamein, A.S.H.(Genetic and cytology Department, NRC 12311 Dokki, Cairo, Egypt) **Selection for high yield and chromosome quality in khella (Ammi visnaga L.) II. Developmental behaviour of early dwarfs.** *Journal of Research and Education in Indian Medicine*, v. 10(4): p. 17-24, 1991 (11 ref, Eng).

Three groups of early dwarf families of *A.visnaga* were developed through short cut selection, implicating heat shock treatment and selection for competition ability in dense culture. The behaviour of selected families in development of the third primary leaf at 66 days shows apparent genetic control which was attributable to simple genic effects following 3rd leaf length at 66,100,120 days after receiving NPK. The broad sense and narrow sense heretability and genotypic and phenotypic interactions have been discussed.

9204-2110 Bhavani Sanker, K., Abdul Khader, M.(College of Horticulture, Tamil Nadu Agricultural University, Coimbatore 641003, TN, India) **Studies on genetic variability in coriander.** *South Indian Horticulture*, v. 39(5): p. 312-314, 1991 (5 ref, Eng).

Selfed progenies of 30 cultivars/genotypes of *Coriandrum sativum* were evaluated for fruit yield and six yield determining characters. The characters primary branches and primary umbels per plant recorded the highest GCV, heritability and genetic advance. Yield was however positively correlated with only number of secondary branches and other characters had no bearing on the yield.

9204-2111 Bhavani Sanker, K., Abdul Khader, M.(College of Horticulture, Tamil Nadu Agricultural University, Coimbatore 641003, TN, India) **Correlatiion studies and path analysis of yield and yield components in coriander.** *South Indian Horticulture*, v. 39(6): p. 384-386, 1991 (1 ref, Eng).

The total correlation coefficients between fruit yield and the six component characters indicated the yield to be positively correlated with number of secondary branches only. Secondary branches and umbelllets per umbel were found to be correlated with height, while the secondary umbels per plant to have the largest direct effect on fruit yield.

9204-2112 Bir, S.S., Cheema, Paramjeet, Sidhu, M.K.(Department of Botany, Punjabi University, Patiala 147002, Punjab, India) **Chromosomal analysis of *Fimbristylis Vahl* in Punjab. North West India.** *Proceeding Indian National Science Academy*, v. B58(1): p. 63-70, 1992 (35 ref, Eng).

Chromosomal analysis of populations of nine species of sedges namely, *F. bisumbellata* (10 populations) $n=5=2x$, *F. dichotoma* (5 populations) $n=5=2x$ and $n=10=4x$, *F. falcatia* $n=11=2x$, *F. ferruginea* (3 populations) $n=10=4x$, *F. miliacea* (3 populations) $n=5=2x$, *F. monostachya* $n=5=2x$, *F. polytrichoides* $n=5=2x$, *F. quinquangularis* (5 populations) $n=5=2x$ and *F. tenera* $n=20=8x$ has been made. Chromosomes recorded are quite different from previous reports and have revealed the existence of 'biological' species within the circumvention of accepted species. Lack of aneuploid numbers in *Fimbristylis* as compared to *Cyperus*, *Scirpus* and *Carex* is possibly due to the presence of localized centromere on the chromosomes making non-viable chromosome fragments.

9204-2113 Gopal, G.V., Misra, R.(Department of Life Sciences, Regional College of Education, Bhubaneswar 751007, Orissa, India) ***Uraria picta* Desv., a rare germplasm of potential medicinal value.** *Journal of Research and Education in Indian Medicine*, v. 10(3): p. 13-15, 1991 (3 ref, Eng).

U. picta a native of tropical Africa and Asia is becoming extinct, is an important constituent of the Ayurvedic preparations, Dasamula Kwath or 'Dasamularista'. The plant is facing extinction and needs special efforts for conservation.

9204-2114 Kandalkar, V.S., Patidar, H.* , Nigam, K.B.* (Kailash Nath Katju College of Agriculture, Jawaharlal Nehru Krishi Vishwa Vidyalaya, Campus Mandsaur, 458001, MP, India) **Analysis of gene effects, heterosis and inbreeding depression in Asgandh (*Withania som-***

nifera). *Indian Journal of Agricultural Sciences*, v. 62(5): p. 329-331, 1992 (5 ref, Eng).

An experiment was conducted during 1991 to study gene effects, type of epistasis, heterosis and inbreeding depression for 6 traits in 5 generations (P1,P2,F1,F2 and F3) of 2 crosses ('WS 20 x wild and 'WS 22' x wild) in Asgandh *W. somnifera*. Additive and non-additive gene effects were involved in the inheritance of plant height, days to 50 percent flowering, shoot branches, root length, root branches/plant and root yield/plant. Dominance effects were predominant for root yield. Epistasis played an important role in the inheritance of component characters, except root length and plant height in 'WS 20' wild. Complementary type of gene action was present for all the characters. 'WS 22' x wild showed greater heterosis over mid-parent than 'WS 20' x wild. High heterotic crosses were also present with high inbreeding depression in F2 and F3 generations.

9204-2115 Madulid, D.(National Museum, The Philippines) **The conservation status of *Hedychium philippinense*.** *Zingiberaceae Workshop, Prince of Songkla University, Hat Yai, Thailand*, p. 23, 15-18 Oct. 1991 (Eng).

H. philippinense is a species of the family Zingiberaceae which once was common in primary forests in many parts of the Philippines. Due to forest destruction, the habitat of this epiphytic plant has been severely affected to the extent that it has now become very rare in the wild. This plant is listed in CITES Appendix II and its export is regulated by the government. It is recommended that this plant be propagated both in situ and ex situ to ensure its preservation..

9204-2116 Misra, H.O., Sharma, J.R., Lal, R.K.(Central Institute of Medicinal and Aromatic Plants, Lucknow 226016, UP, India) **Inheritance of biomass yield and tropane alkaloid content in *Hyoscyamus muticus*.** *Planta Medica*, v. 58(1): p. 81-83, 1992 (10 ref, Eng).

The nature of gene action for biomass yield and tropane alkaloid content was ascertained through diallel analysis in Egyptian henbane, *H. muticus*. Dominance variation was preponderant over additive genetic variance, dominance being in the overdominance range for both traits. On an overall basis, recessive alleles has a positive effect on both the characters. However, the positive or negative effects of recessive or dominant alleles were genotype-specific. Hence, transgressive breeding was suggested for isolating segregants with dominant alleles for herb yield and with recessives for alkaloid content so as to achieve overall high yields of tropane alkaloid per unit area.

9204-2117 Salamon, I.(Department of Experimental Botany & Genetics, PJ Safarik University, Kosice, Czechoslovakia) **Production of chamomile, Chamomilla recutita (L.) Rauschert, in Slovakia.** *Journal of Herbs, Spices & Medicinal Plants*, v. 1(1&2): p. 29-34, 1992 (19 ref, Eng).

Selections of chamomile, (*C. recutita*), have resulted in the development of types with higher oil concentrations and considerable differences in essential oil constituents. Tests on mechanical chamomile harvesters indicated a vacuum system worked best for transport of flower heads, preventing damage to the tissue.

9204-2118 Wold, J.K., Paulsen, B.S., Haugli, T., Nordal, A., Laane, M.M.(Institute of Pharmacy, University of Oslo, P.O.Box 1068, Blindern, N-0316 Oslo 3, Norway) **Increase in thebaine content of Papaver bracteatum Lindl. after colchicine treatment of seeds. Annual fluctuations in thebaine level of individual plants.** *Acta Pharmaceutica Nordica*, v. 4(1): p. 31-34, 1992 (17 ref, Eng).

From colchicine-treated seeds of *P. bracteatum* some poppy plants were obtained that developed capsules richer in thebaine than the controls. The individual poppies were analyzed for capsule thebaine content annually for eight successive years, the results revealing significant year-to-year differences. One of the poppies, X7, (ca 5 percent thebaine) developed capsules consisting partly of polyploid tissue during the first and second year. This plant was propagated vegetatively to give a series (the X7 series) of new *P. bracteatum* plants. The capsule thebaine content of these individuals differed markedly the first two years, whereupon the alkaloid production decreased and appeared to level out and reach a value still clearly higher than the controls (mean values 2.3 percent and 1.3 percent, respectively). From seeds of four of the thebaine-rich poppies of the X7 series, four new series of *P. bracteatum* plants were obtained. The capsule thebaine level of these was significantly lower than that of the mother plants.

9204-2119 Zhong-yi, C.(South China Institute of Botany, China) **The germplasm conservation and hybrid breeding of Chinese Zingiberaceae.** *Zingiberaceae Workshop, Prince of Songkla University, Hat Yai, Thailand*, p. 21, 15-18 Oct. 1991 (Eng).

The total area of ginger garden is 2 hectares in the South China- Botanical Garden, including an experimental field, reproductive field and exhibition ground. The garden is aimed at the introduction and acclimatization of Chinese Zingiberaceae and offers a large quantity of living materials for multidisciplinary studies on botany, including cytology, palynology, morphology, phytochemistry and genetics. A program utilizing the germplasm of Chinese Zingiberaceae

to increase propagation rates has resulted in new cultivars such as:- *Alpinia zerumbet* cv. *yuhua*, *A. henryi* x *polyantha*, and *Amomum villosum* x *A. katsumada*.

Diseases & Pests

9204-2120 Hashmi, M.H., Gaffar, A.(Department of Botany, University of Karachi 75270, Pakistan) **Seed-borne mycoflora of Coriandrum sativum.** *Pakistan Journal of Botany*, v. 23(2): p. 165-172, 1991 (13 ref, Eng).

Of the 88 samples of coriander from 15 countries examined, 14 genera and 24 species of fungi were isolated *Alternaria alternata*, *Fusarium moniliforme* and *Phoma* spp. were predominant in seed samples of Pakistan and India. In pathogenicity tests, *F. solani* caused seed rot and wilting of coriander seedlings.

9204-2121 Hashmi, M.H., Gaffar, A.(Department of Botany, University of Karachi, Karachi 75270, Pakistan) **Phoma multirostrata on coriander in Pakistan.** *Pakistan Journal of Botany*, v. 23(1): p.127-130, 1991 (8 ref, Eng).

Pathogenicity of fungus *Phoma multirostrata* causing foot-rot disease of *Coriandrum sativum* has been reported.

9204-2122 Rajan,F.S., Peter, F.S., Vedamuthu, M.D., Abdul Khader, Jeyarajan, R.(Tamil Nadu Agricultural University, Coimbatore 641003, TN, India) **Management of root-rot disease of fenugreek.** *South Indian Horticulture*, v. 39(4): p. 221-223, 1991 (8 ref, Eng).

Control measures of drenching twice with carbendazim 0.1 percent, once at the initial appearance of the disease and the second after 30 days or the application of neem cake 1 t/ha were found to be effective against root rot disease of *Trigonella-foenum-graecum* caused by *Rhizoctonia solani* have been reported.

9204-2123 Rizvi, S.J.H., Rizvi, V.(Laboratory of Allelopathy and Natural Products, Basic Sciences Faculty, Rajendra Agricultural University, Pusa, Samastipur, Bihar 848125, India) **Possible use of natural products in integrated pest management.** *7th Asian Symposium on Med. Plants, Spices and Other Natural Prod.(ASOMPS VII.) Manila*, 2-7 February 1992 (Eng).

Natural products were screened for their weed and fungi-controlling properties in the hope of identifying a multipurpose pesticide for use in integrated pest management. *Amaranthus spinosus* and *Alternaria solani* were the test weed and fungus, respectively. Among the plant products tested, geraniol proved to be most potent against both test organisms. It completely blocked seed germination of *A. spinosus* at a concentration of 3mM and mycelial growth of *A. solani* at 2.8 mM..

9204-2124 Tejada, A.W., Araez, L.C., Ocampo, V.R.(National Crop Protection Center, University of Philippines at Los Banos, 4031, College, Laguna, Philippines) **Residues of pesticides and the effect of processing on the reduction of residues in medicinal plants.** *7th Asian Symposium on Med. Spices, and Other Natural Prod. (ASOMPS VII). Manila, 2-7 February 1992* (Eng).

The residues of some pesticides as a consequence of crop protection were determined in Lagundi *Vitex negundo*, sambong *Blumea balsamifera* and issang gubat *Carmona retusa*. Among the insecticides tested carbaryl and BPMC + Chlorpyrifos had the least number of insects seven days after application on plants. A 7 day pre harvest interval may be considered safe for all pesticides tested except for mancozeb treated plants which should be harvested after 20 days. The residues of the pesticides were reduced by as much as 50 to 100 percent with washing and cooking; while 24 to 98 percent with drying and pulverizing. (Abstr. No. TO-26).

9204-2125 Zaragoza, B.A.(Bicol Experiment Station, Department of Agriculture, Pili, Camarines Sur) **Evaluation of organic materials for the control of root-knot nematode (*Meloidogyne incognita* Chitwood) affecting black pepper (*Piper nigrum* L.).** *7th Asian Symposium on Med. Plants, Spices, and Other Natural Prod. (ASOMPS VII). Manila, 2-7 February 1992* (3 ref, Eng).

Two-month old marcotted black pepper seedlings planted in plastic bag with sterile soil were inoculated with larvae of the nematodes. Ten days, later, the organic soil amendment materials were added, namely chicken dung, azolla and plant compost and the control chemical, carbofuran. Results show the effect on galling index, number of nematodes recovered and root and top weights. On gall formation, treatments with chicken dung rated 2.5 and did not differ significantly with carbofuran at 2.7. The number of female nematodes recovered in the azolla treatment was highest with 40.0 per two-gram roots, followed by chicken dung and furadan (carbofuran). For number of egg-masses, chicken dung had the lowest count and significantly different with azolla, carbofuran and the untreated check. (Abstr. No. MP-23).

Physiology & Biochemistry

9204-2126 Aerts, R.J., Verpoorte, R.* (Department of Pharmacognosy, Center for Bio-Pharmaceutical Sciences, Leiden University, PO Box 9502, 2300 RA Leiden) **Influence of tryptophan and tryptamine feeding and light on alkaloid biosynthesis in *Cinchona* seedlings.** *Planta Medica*, v. 58(2): p. 150-152, 1992 (22 ref, Eng).

It has previously been shown that, at the onset of germination of *Cinchona* seeds, tryptophan feeding slightly raised the tryptophan-decarboxylase (TDC) activity in the seedlings, but alkaloid production remained unaltered. During typtamine feeding, the transient increases in tryptophan level and TDC activity were still observed, and also here, alkaloid production remained unaltered. Finally, in etiolated seedlings the alkaloid biosynthetic pathway proceeded normally. Thus in germinating *C. ledgeriana* seedlings alkaloid production is not susceptible to tryptophan or tryptamine feeding and independent of light.

9204-2127 Belarmino, M., del Rosario, A.G.(University of the Philippines at Los Banos, Laguna, Philippines) **Callus induction and organogenesis in *Dioscorea* species.** *Japanese Journal of Breeding*, v. 41(4): p. 561-569, 1991 (13 ref, Eng).

To examine variation in species/organ specificity for callus induction and organogenesis in *Dioscorea esculenta*, *D. rotundata* and *D. alata*, axillary buds or shoot tips and single-node segments with one or two axillary buds were inoculated onto the culture media containing various combinations of plant hormones. Species or line and organ specificity for callus and organ formation and plant regeneration from calli and direct proliferation from axillary buds have been reported. *D. alata* with poor seed formation regenerated plants from calli and also directly from single-node segment through the proliferation of axillary buds. IARI, New Delhi.

9204-2128 Breinholt, J., Damtoft, S., Demuth, H.*, Jensen, S.R., Nielsen, B.J.(Department of Organic Chemistry, The Technical University of Denmark, Building 201, DK 2800 Lyngby, Denmark) **Biosynthesis of antirrhinoside in *Antirrhinum majus*.** *Phytochemistry*, v. 31(3): p. 795-797, 1992 (9 ref, Eng).

Feeding experiments with deuterium labelled 8-epi-iridodial glucoside, 8-epi-iridotriol glucoside and the corresponding aglucones gave incorporation of all compounds into antirrhinoside in *A. majus*.

9204-2129 Cessna, A.I.(Agriculture Canada, Research Station, Regina, Saskatchewan, Canada S4P 3A2) **The determination of the herbicide terbacil in asparagus spears by gas chromatography.** *Canadian Journal of Plant Science*, v. 71(3): p. 915-921, 1991 (22 ref, Eng, Fre).

In a 2-years study, asparagus (*Asparagus officinalis*) spears from established plantings at two sites in British Columbia and one site in Ontario were analyzed for terbacil residues following preemergence and early postemergence applications of terbacil at 0.6, 1.1 and 2.2 kg ha⁻¹. Gas chromatographic determination of terbacil residues using

N-specific alkali flame ionization detection indicated that at one site, maximum terbacil residues in the preemergence samples were 14+-3 microg kg⁻¹ for the 2.2 kg ha⁻¹ application rate, whereas maximum residues in the early postemergence samples for the 2.2 kg ha⁻¹ application rate were 493+-250 microg kg⁻¹ at a second site. Recoveries of terbacil from fortified asparagus tissue were 96+-19 percent, 87.2+-11.9 percent and 83.3+-7.8 percent at 10.50 and 100 microg kg⁻¹ respectively.

9204-2130 Conchou, O., Nichterlein, K.* , Vomel, A.(Institut fur Pflanzenbau und Pflanzenzuchtung 1, Justus-Liebig-Universitat Giessen, Ludwigstr, 23,D(W)-6300 Giessen, Federal Republic of Germany) Shoot tip culture of *Arnica montana* for micropropagation. *Planta Medica*, v. 58(1): p. 73-76, 1992 (17 ref, Eng).

Multiple shoots were regenerated from shoot tips of *A.montana* on MS and B5 media supplemented with BA (1mg/l) and NAA (0.1mg/l). Sections of 1-2 mm in length cultured from in vitro germinated seedlings regenerated 7.7 (mean) shoots on the MS medium, whereas sections cultured from greenhouse plants regenerated 9.0 (mean) shoots on the B5 medium within 6 weeks. Subsequent subcultures of shoots on the same media but without NAA resulted in similar or lower multiplication rates. Shoot development was promoted, whereas shoot initiation was simultaneously inhibited by the addition of activated charcoal to the media. Rooting was induced by culturing shoots from seedling as well as from greenhouse plant shoot tips on MS or B5 medium supplemented with NAA. The plantlets were transplanted into soil and grown successfully under greenhouse and field conditons.

9204-2131 De Bruyn, A., Verhegge, G., Lambein, F.(Laboratory of Physiological Chemistry, State University of Ghent, KL Ledeganckstraat 35, B 9000 Ghent, Belgium) Mechanism for the photolysis of the naturally occurring isoxazolin-5-ones and the link with the *Lathyrus* toxins. *Planta Medica*, v. 58(2): p. 159-162, 1992 (21 ref, Eng).

In aqueous solution, N-substituted isoxazolin-5-one derivatives, which occur in high amounts in seedlings of the tribe Vicieae, can be shown to undergo a proton exchange at C-4, indicative of their aromatic character. Under UV-light these different isoxazolin-5-one derivatives are then broken down, each following the same degradation scheme, some of them forming the well-known toxins of the genus *Lathyrus*. The loss of aromatic character and the addition of two water molecules is proposed as the underlying mechanism for this photolysis. The biochemical relation between isoxazolin-5-ones and the *Lathyrus* toxins is discussed.

9204-2132 Eknakul, W.D., Zenk, M.H.(Lehrstuhl fur Pharmazeutische Biologie, Universitat Munchen, Karlstrasse 29, 8000 Munchen 2, Germany) Purification and properties of 1,2-dehydroreticuline reductase from *Papaver somniferum* seedlings. *Phytochemistry*, v. 31(3): p. 813-821, 1992 (16 ref, Eng).

1,2-Dehydroreticuline reductase, the NADPH-dependent enzyme which reduces stereospecifically 1,2 dehydroreticuline to (R)-reticuline has been discovered in seedlings of the opium poppy *P.somniferum*.

9204-2133 Grabowski, L., Heim, S., Wagner, K.G.* (GBF, Enzymologie, Mascheroder Weg 1, D-3000 Braunschweig, Germany) Rapid changes in the enzyme activities and metabolites of the phosphatidylinositol cycle upon induction by growth substances of auxin-starved suspension cultured *Catharanthus roseus* cells. *Plant Science*, v. 75(1): p. 33-38, 1992 (24 ref, Eng).

Induction of cell proliferation by 2,4-D revealed a very fast (maximum 1 min after addition of the growth substance) increase in inositol-1,4-biphosphate (Insipi) decrease in Phosphatidylinositol mono- and diphosphate (DIP) and increase in phosphatidylinositol (PI) activity. Addition of alpha-NAA and kinetin resulted in a very fast decrease of PI and PIP (1 min after induction) and a concomitant decrease in the activities of PI-kinase, PG-kinase whereas slightly slower (2 min after induction) but very strong increase in Ins1 P1 and Ins1, 4P2 were observed. These results demonstrate that the activities of the PI-cycle are responsive towards phytohormones. IARI, New Delhi.

9204-2134 Granger, I., Gal, C.S.* , Augereau, J.M., Gleye, J. (Laboratoire de Biochimie Exploratoire, Snofi Recherche, 195, Route d'Espagne, F-31036 Toulouse Cedex, France) Benzophenanthridine alkaloids isolated from *Eschscholtzia californica* cell suspension cultures interact with vasopressin (V1) receptors. *Planta Medica*, v. 58(1): 35-38, 1992 (17 ref, Eng).

Chelerythrine and sanguinarine, two benzophenanthridine alkaloids, have been isolated from a crude methanolic extract of *E.californica* cell suspension cultures by successive fractionations. These two molecules exhibited affinity for rat liver vasopressin V1 receptors and are competitive inhibitors of ³H-vasopressin binding within the micromolar range (Ki). Chelerythrine and sanguinarine represent two of the first non-peptidic structures providing original chemical leads for the design of synthetic vasopressin compounds.

9204-2135 Halva, S., Craker, L.E., Simon, J.E., Charles, D.J. (Department of Plant and Soil Sciences, University of Massachusetts, Amherst, MA 01003, USA) Light levels

and the growth of dill (*Anethum graveolens* L.). *Journal of Herbs, Spices & Medicinal Plants*, v. 1(1&2): p. 35-42, 1992 (18 ref, Eng).

The effect of light level on growth and development of dill herb was studied in a greenhouse under full sunlight and under 70, 50 and 30 percent of full sunlight. Decreasing light levels resulted in decreases in leaf number area and plant height. Dill growth and essential oil accumulation increased with increases in the light level and was greatest under full sunlight. Of the essential oil constituents concentrations of beta-pinene and p-cymene were decreased and increased respectively by reduced light levels.

9204-2136 Halva, S., Cracker, L.E., Simon, J.E., Charles, D.J. (Department of Plant and Soil Sciences, University of Massachusetts, Amherst, MA 010003, USA) **Light quality, growth and essential oil in dill (*Anethum graveolens* L.).** *Journal of Herbs, Spices & Medicinal Plants*, v. 1(1&2): p. 43-50, 1992 (18 ref, Eng).

The effect of light quality on growth and essential oil production in dill herb was studied by comparing plants receiving supplemental red, far-red, and blue end-of-day light treatments with control plants not receiving any supplemental light treatment. No significant differences were observed in biomass yield from end-of-day light treatments, but control plants and blue light-treated plants had shorter internodes and produced relatively high herb yields. Far-red light induced internode growth, decreased leaf area, and increased the rate of plant development more than all other light treatments. Red light also increased plant growth and induced an elongation of the internodes. Essential oil concentration was highest in plants grown under far-red light treatments. Red light treatment for 4 h also induced more oil production than control and blue light treatments. When the dill plants were exposed to 4 h of red and far-red light, yields of benzofuranoid, alpha-phellandrene, beta-phellandrene, p-cymene, and other essential oil constituents, except for myristicin, were increased as compared with plants exposed to control, blue light, or 2 h light treatments.

9204-2137 Kajimura, K., Iwamoto, Y., Yoshida, S., Yamasaki, K., Tanaka, R., Suzuki, S., Nakazawa, H., Yoneda, K. (Osaka Prefectural Institute of Public Health, 1-3-69 Nakamichi, Higashinari-ku, Osaka 537, Japan) **Studies on cultures of *Astragalus mongholicus* (1) Amino acids composition in seeds, young plantlets and cell cultures.** *Shoyakugaku Zasshi*, v. 45(4): p. 293-298, 1991 (11 ref, Jap, Eng).

The seeds, young plantlets and cells from the cultures of *A.mongholicus* were investigated for their amino acid compositions. Canavanine was contained in large amounts in the seeds and young plantlets, in a small amount in the

primary callus culture, and not at all in the callus tissues subcultured for two years. On the contrary, the gamma-amino butyric acid (GA-BA) concentration in the callus was higher than those in the seeds and young plantlet. It was found that the ratio of the free amino acid content to the total amino acid content of the primary callus was higher than the corresponding ratio of the callus tissues subcultured for two years. The changes in the GABA concentration observed during the cell growth was different from the corresponding changes in the concentrations of other protein amino acids. It was observed that the cells released amino acids into the medium when they were in the stationary phases.

9204-2138 Kantharajah, A.S., Dodd, W.A. (Faculty of Horticulture, University of Western Sydney, Hawkesbury, Richmond 2753, Australia) **Rapid clonal propagation of *Moringa oleifera* Lam., using tissue culture.** *South Indian Horticulture*, v. 39(4): p. 224-228, 1991 (11 ref, Eng).

In vitro propagation technique of *M.oleifera* using nodal explants has been described. An average of 22.1+6.3 shoots per explant developed in the woody plant medium with 2 percent sucrose, solidified with 0.8 percent agar and supplemented with 1 mg 1-1 BAP. Root formation was achieved readily using MS basal medium with 0.5 mg 1-1 NAA. Juvenile tissues were found less useful as a source of explant for micropropagation.

9204-2139 Kawazoe, S., Mizukami, H., Ohashi, H. (Faculty of Pharmaceutical Sciences, Nagasaki University, Bunkyo-machi 1-14, Nagasaki 852, Japan) **Cultivation and breeding of *Uncaria rhynchophylla* (Miq.)Miquel (VII) Effect of temperature on growth, crude drug "Cho-to-ko" yield and oxindole alkaloid content.** *Shoyakugaku Zasshi*, v. 45(4): p. 281-288, 1991 (10 ref, Jap, Eng).

U.rhynchophylla plants were cultivated under high (35/30 degree C, day/night), medium (25/20 degree C) and low (15/10 degree C) temperature conditions in a biotron growth cabinet. The plants were also cultivated under low daily temperature fluctuations of 3 degree C (28/25 degree C, day/night), 8 degree C (28/20 degree C) and 13 degree C (28/15 degree C). When the night temperature was lower, the oxindole alkaloid content tended to be higher. It was concluded that the 25-28/20 degree C (day/night) condition with a daily temperature difference of 5-8 degree C was the most suitable for the cultivation of *U.rhynchophylla*; under these conditions, both the crude drug "Cho-to-ko" yield and the oxindole alkaloids content were high.

9204-2140 Kinjo, J., Higuchi, H., Fukui, K., Nohara, T.* (Faculty of Pharmaceutical Sciences, Kumamoto University, 5-1 Oehonmachi, Kumamoto 862, Japan) **Lignoids from *Albiziae Cortex*. II. A biodegradation**

pathway of syringaresinol. *Chemical & Pharmaceutical Bulletin*, v. 39(11): p. 2952-2955, 1991 (5 ref, Eng).

Five new lignoid glycosides including a novel lignan were isolated from *Albiziae cortex*, the dried stem bark of *A.julibrissin*. Three of them appear to be key metabolites of a biodegradation pathway for syringaresinol.

9204-2141 Kitamura, Y., Sato, M., Miura, H.(Faculty of Pharmaceutical Sciences, Nagasaki University, Nagasaki 852, Japan) **Differences of atropine esterase activity between intact roots and cultured roots of various tropane alkaloid-producing plants.** *Phytochemistry*, v. 31(4): p. 1191-1194, 1992 (23 ref, Eng).

The tropane alkaloid distribution and atropine esterase activity in *Atropa belladonna*, *Datura tatula*, *Duboisia leichhardtii*, *Hyoscyamus niger* and *Scopolia japonica* were determined at various development stages and compared with those in their cultured roots. High atropine esterase activity was found in the roots of every tropane alkaloid-producing plant at any stage of development, though much higher activities were detected in the roots of annual and biennial herbs at the fruiting stage. No cultured roots contained detectable amounts of atropine esterase activity in spite of their production of hyoscyamine and scopolamine.

9204-2142 Kowalski, J., Strzelecka, H.(Katedra i Zaklad Farmakognozji, Instytut Nauki O Leku, Akademia Medyczna, ul. Banacha 1, 02-097 Warszawa, Polska) **Influence of the benzimidazol derivatives on the stimulating effect of lanatoside C biosynthesis in different development phases of Digitalis lanata Ehrh.** *Herba Polonica*, v. 36(3): p. 82-87, 1990 (Recd. 1992, 6 ref, Eng).

Effect of fungicides Benlate and Topsin on the synthesis of lanatoside C in *D.lanata* leaves has been investigated in the field experiment. The best stimulating effect on lanatoside C biosynthesis was observed after treating the seeds with dry substances (4g/kg). The increase of lanatoside C content ranged between 90 to 105 percent. Good results were also observed after single spraying of grecian foxglove seedling (50-94 percent) or plants with 5-7 leaves (50-78 percent). Spraying of mature plants produced only small increase (11-16 percent) only.

9204-2143 Moumou, Y., Trotin, F., Dubois, J., Vasseur, J., El-Boustani, E.(Laboratoire de Pharmacognosie, faculte'de Pharmacie, BP 83, 59006 Lille Cedex, France) **Influence of culture conditions on polyphenol production by Fagopyrum esculentum tissue cultures.** *Journal of Natural Products*, v. 55(1): p. 33-38, 1992 (13 ref, Eng).

Tissue cultures of buckwheat, selected for their anthocyanin content (red in color), were grown in vitro on supplemented Gamborg's medium. Optimal growth was obtained with 2mg/liter 2,4-D and 30 g/liter sucrose, over a 20-day culture period in light or a 30-day period in darkness; the mass production was similar in both cases (80 mg dry wt per callus). Flavonoids and anthocyanins were mainly synthesized under light, with a correlation between amount produced and growth. Synthesis of catechins and procyanidins was less dependent on light conditions. The flavonoids, isoquercitrin, rutin, and hyperin, existed at low levels regardless of culture age. Levels of quercetin-3-rhamnogalactoside were higher, with an optimum reached on the 16th day (according to their low flavonoid synthesis capacity). Buckwheat tissue cultures are characterized by good catechin and procyanidin production.

9204-2144 Moumou, Y., Vasseur, J., Trotin, F., Dubois, J. (Laboratoire de Physiologie de la Differentiation et Biotechnologies Vegetales, Universite des Sciences et Techniques de Lille-Flandres Artois, 59655 Villeneuve d'Ascq Cedex, France) **Catechin production by callus cultures of Fagopyrum esculentum.** *Phytochemistry*, v. 31(4): p. 1239-1241, 1992 (10 ref, Eng).

The effects of sucrose, 2,4-D, light and darkness on growth and catechin production by callus cultures from hypocotyls of *F.esculentum* are described. The calli produced mainly (-)-epicatechin-3-O-gallate (1.5-6.0mg/g dry wt) besides (+)-catechin and (-)-epicatechin (each 0.5-2.0mg/g dry wt). Moderate sucrose (10-30 g/l) and 2,4-D concentrations (2-5mg/l) improved growth and epicatechin-3-O-gallate content. Production kinetics of epicatechin-3-O-gallate differed in light and in darkness; the other catechins were influenced little.

9204-2145 Neera, S., Ishimaru, K.(Department of Applied Biological Sciences, Faculty of Agriculture, Saga University, 1 Honjo, Saga, 840, Japan) **Tannin production in cell cultures of Sapium sebiferum.** *Phytochemistry*, v. 31(3): p. 833-836, 1992 (17 ref, Eng).

Callus and cell suspension cultures of *Sapium sebiferum* were established and the production of gallic acid, beta-glucogallin, geraniin, furosin, tercatain, chebulagic acid, chlorogenic acid, 1,2,3,6-tetra-O- and 1,2,3,4,6-penta-O-galloyl-beta-D-glucoses established. Both in the callus and cell suspension cultures, the main phenolic constituent was geranin.

9204-2146 Noel, M., Dayrit, F., Finch, P.(De La Salle University, Taft Ave., Manila) **Production of secondary metabolites by plant tissue culture of Vitex negundo, Linn.** *7th Asian Symposium on Med. Plants, Spices, and*

Other Natural Prod. (ASOMPS VII). Manila, 2-7 February 1992 (Eng).

Callus and suspension cultures of *V.negundo* were established for the production of secondary metabolites. Procedure for the maintenance and propagation of the tissue culture, the effects of varying the levels of plant nutrients and growth regulators, as well as growth conditions on the secondary metabolites have been reported. The metabolites produced by the callus, suspension culture and the intact plant have been compared. The effects of a yeast elicitor which was added to the cell suspension culture were discussed. (Abstr. No. WP-1).

9204-2147 Omer, E.A., Ouda, H.E., Ahmed, S.S.(Pharmaceutical Sciences Department, National Research Centre, Dokki, Cairo, Egypt) **Seasonal changes in the yield and volatile oils of sweet marjoram (Marjorana hortensis) cultivated in newly reclaimed lands in Egypt.** 7th Asian Symposium on Med. Plants, Spices, and Other Prod.(ASOMPS VII). Manila, Philippines, 2-7 February 1992 (2 ref, Eng).

Marjoram seedlings were transplanted in April. The land used for cultivation was sandy soil in texture (96 percent sand) with pH 8.3. The irrigation system was spraying (Pivot system). Three cuttings were taken during the season on July, October and February. Within each cutting, monthly sample was taken to determine the oil percent and studying the changes in its main components. The results indicated that cutting in October gave the highest dry leaves yield and oil content. The analyses of monthly samples showed the maximum oil percent on October (2.6 percent) while the sample of April showed the lowest oil percent (1.7 percent). The GLC analyses of the oil of each sample revealed that the maximum percent of oxygenated compounds (linalool, linalylacetate, terpinen-4-ol and terpeniol) was observed in the sample of November (95.5 percent). (Abstr. No. MP-26).

9204-2148 Orihara, Y., Furuya, T., Hashimoto, N., Deguchi, Y., Tokoro, K., Kanisawa, T.(School of Pharmaceutical Sciences, Kitasato University, Minato-ku, Tokyo 108, Japan) **Biotransformation of isoeugenol and eugenol by cultured cells of Eucalyptus perriniana.** *Phytochemistry*, v. 31(3): p. 827-831, 1992 (17 ref, Eng).

Three new biotransformation products, eugenyl beta-rutinoside, and isoeugenyl beta-gentiobioside and beta-rutinoside, together with eugenyl beta-glucoside and beta gentiobioside, and isoeugenyl beta-glucoside, were isolated from jar fermentor culture of *E.perriniana* following administration of eugenol and isoeugenol, respectively. This is the first report of rhamnosylation in a biotransformation catalysed by cultured cells of *E.perriniana*.

9204-2149 Portsteffen, A., Draeger, B., Nahrstedt, A.(Institut fur Pharmazeutische Biologie und Phytochemie, Westfälische Wilhelms-Universität Münster, Hittorfstrasse 56, D-4400 Münster, Germany) **Two tropinone reducing enzymes from *Datura stramonium* transformed root cultures.** *Phytochemistry*, v. 31(4): p. 1135-1138, 1992 (11 ref, Eng).

Two different tropinone reductases (TR) were isolated from transformed root cultures of *D.stramonium*. Gas chromatographic analysis of the reaction products showed one enzyme activity forming tropine only (TR I) and the other forming exclusively pseudotropine (TR II). TR I after extraction and purification showed about five-fold activity of TR II. Characterization of both enzymes revealed differences to tropinone reductases isolated previously from *D.stramonium*, *D.innoxia* and *Hyoscyamus niger*, and differences between the individual enzyme proteins.

9204-2150 Rosazza, J.P.N., Duffel, M.W., El-Marakby, S., Ahn, S.H.(Division of Medicinal and Natural Products Chemistry and Center for Biocatalysis and Bioprocessing, College of Pharmacy, University of Iowa, Iowa City, Iowa 52242, USA) **Metabolism of the *Catharanthus* alkaloids: from *Streptomyces griseus* to monoamine oxidase B.** *Journal of Natural Products*, v. 55(3): p. 269-284, 1992 (57 ref, Eng).

Results have clarified the involvement of enzymatic and chemically catalyzed one-electron oxidations that yield nitrogen-centered cation radicals, iminium, and carbolamine intermediates, all of which explain how new carbon-carbon and carbon-oxygen bonds form, or break and rearrange. The dimeric *Catharanthus* alkaloids are recalcitrant to oxidations catalyzed by monoamine oxidases and to both normal and induced P-450 microsomal preparations. However, the *Catharanthus* alkaloids appear to be selective reversible inhibitors of monoamine oxidase-B. Chemical and biochemical aspects of the metabolic transformations of dimeric *Catharanthus* alkaloids are reviewed together with the implications of our findings.

9204-2151 Saimoto, H., Nakagawa, S., Kobayashi, M., Fujioka, S., Barreto, M.C.C., Sakurai, A.*., Syono, K.(The Institute of Physical and Chemical Research (RIKEN), Wako-shi, Saitama, 351-01, Japan) **Endogenous levels of gibberellins, IAA and cytokinins in *Catharanthus* crown gall tissues of different tumor types.** *Plant Cell Physiology*, v. 31(3): p. 365-370, 1990 (17 ref, Eng).

Endogenous levels of gibberellins, auxins and cytokinins in crown gall tissues of *C.rosecus* of two different tumor types, induced by a nopaline-type and an octopine-type Ti-plasmid, were examined. The levels of gibberellins were higher in nopaline-type V208 cells than in octopine-

type V277 cells. GA12 and GA24 were identified from V208 cells. The level of IAA was 20-fold higher in V208 cells than in V277 cells. The level of trans-ribosylzeatin was higher in V277 cells than in V208 cells, whereas transzeatin was present at higher levels in V208 cells than in V277 cells. The results revealed that the production of gibberellins, as well as of IAA and cytokinins, in the crown gall tissues of *C. roseus* differed between the octopine- and nopaline-type tumors, even though the crown galls apparently grow as unorganized aggregates of cells in both cases. JICST, Tokyo.

9204-2152 Saito, K., Yamazaki, M., Murakoshi, I. (Faculty of Pharmaceutical Sciences, Chiba University, Chiba 260, Japan) **Transgenic medicinal plants: Agrobacterium-mediated foreign gene transfer and production of secondary metabolites.** *Journal of Natural Products*, v. 55(2): p. 149-162, 1992 (101 ref, Eng).

Agrobacterium-Ti/Ri plasmids are natural gene vectors, by which a number of attempts have been made in genetic engineering of secondary metabolism in pharmaceutically important plants in the last few years. Opines are biosynthesized by transformed crown galls and hairy roots integrated with T-DNAs of Ti/Ri plasmids. The production of opines is a natural example of genetic engineering of the biosynthetic machinery of plant cells for the benefit of the bacterial pathogen. Production of opines in plants and recent advances of genetic manipulation of secondary metabolism by transgenic technology have been reviewed.

9204-2153 Shimomura, K., Sauerwein, M., Yoshimatsu, K. (Tsukuba Medicinal Plant Research Station, National Institute of Hygienic Sciences, 1-Hachimandai, Tsukuba, Ibaraki 305, Japan) **Production and regulation of secondary metabolites in transformed root "normal" and "green" hairy roots.** *7th Asian Symposium on Med. Plants, Spices and Other Natural Prod. (ASOMPS VII)*, Manila, 2-7 February 1992 (Eng).

Transformed root cultures of medicinal plants afford better yields of the secondary metabolites alkaloids in *Hyoscyamus albus*, terpenes in *Lippia dulcis* and shikonin production in *Lithospermum erythrorhizon*. The details of the techniques are discussed. (Abstr. No. W-3).

9204-2154 Sodi, A.M., Panizza, M., Tognoni, F. (Scuola Superiore di Studi Universitari e Perfezionamento, via carducci 40, Pisa, Italy) **Studies on lavandian callus cultures: Ethylene production in relation to the growth.** *Biologia Plantarum (Praha)*, v. 31(4): p. 247-253, 1989 (Recd. 1992; 9 ref, Eng).

Ethylene production and growth of callus cultures of lavandin *Lavandula officinalis*, *Lavandula latifolia* cv. Grosso have been reported. Callus lines derived from various kinds of primary explants (shoot tip, leaf and calyx), exhibited differences in ethylene production patterns independent of callus growth variations in ethylene evolution were induced in shoot tip callus by means of ACC, AVG and varied amounts of 2,4-D in the culture medium. Following all these treatments, callus growth was not altered. The decrease in 2,4-D concentration caused changes in chl a and water content of the tissues:

9204-2155 Takano, H., Hirano, M., Taniguchi, K., Tanaka, R., Kondo, K. (Advanced Technology Research Laboratory, Onoda Cement Co. Ltd., Kouto-ku, Tokyo 135, Japan) **Rapid clonal-propagation of Matricaria chamomilla by tissue cultured shoot primordia.** *Japanese Journal of Breeding*, v. 41(3): p. 421-426, 1991 (11 ref, Eng).

Shoot primordia were induced from shoot tip of *M. chamomilla* by Tanaka and Ikeda's shoot primordium method. The shoot primordia in MS liquid medium supplemented with 2.0 mg/l BAP proliferated rapidly upto 30 times as large in two weeks. They regenerated rapidly plantlets when transplanted onto pieces of ceramic wool in 1/4 MS liquid medium supplemented with 1 percent sucrose and no phytohormone. IARI, New Delhi.

9204-2156 Tumova, L., Dusek, J., Hubik, J. (Katedra Farmakognozie Farmaceuticke Fakulty Univerzity Karlovy, Heyrovskeho 1203, 50165 Hradec Kralove, Czechoslovakia) **Tissue culture of Ononis arvensis L. Relan as a novel type of growth regulator.** *Ceskoslovenska Farmacie*, v. 40(4-5): p. 178-179, 1991 (4 ref, Cze, Eng).

Relan, a novel culture growth regulator, significantly inhibited the growth of callus culture of *O. arvensis* in all concentrations used and under all light regimens. Relan increased the contact of flavonoids in a statistically significant manner on cultivation under the daylight period in all concentrations tested and on cultivation under uninterrupted highting in the concentrations of 0.1 and 10 mg per litre.

9204-2157 Vlahov, G. (Istituto Sperimentale per la Elaiotecnica, C da Fonte Umano, 65013 Città S Angelo Pescara, Italy) **Flavonoids in three olive (*Olea europaea*) fruit varieties during maturation.** *Journal of Science of Food and Agriculture*, v. 58(1): p. 157-159, 1992 (6 ref, Eng).

Olive fruit flavonoids has been characterised. An olive variety with a constant cyanidin-3-rutinoside; cyanidin-3-glucoside ratio of 1 exhibited lower contents of luteolin-7-glucoside and quercetin-3-rutinoside than

varieties in which the only anthocyanin detected was cyanidin-3-rutinoside.

9204-2158 Whipkey, A., Simon, J.E., Charles, D.J., Janick, J. (Department of Horticulture, Purdue University, West Lafayette, IN 47907, USA) **In vitro production of artemisinin from *Artemisia annua* L.** *Journal of Herbs, Spices & Medicinal Plants*, v. 1(1&2): p. 15-22, 1992 (17 ref, Eng).

Shoot proliferation of *A.annua* was achieved in modified Murashige and Skoog medium supplemented with 1.0mg/liter 6-benzylamino purine (BA). Shoot removed from culture and dipped in 3000 ppm indolebutyric acid, rooted and acclimated to in vivo conditons using mist. Artemisinin was produced in vitro and ranged from 0.4 to 0.7 mg/g dry weight. Of four growth regulators tested (BA, kinetin, butanedioic =-2, 2 dimethylhydrazide, and chloroquant chloride), only BA at 1.0 mg/liter and kinetin at 10.0 mg/liter increased in dry matter production which overcame a decrease in artemisinin content.

9204-2159 Wysokinska, H., Skrzypek, Z. (Department of Biology and Pharmaceutical Botany, Institute of Environmental Research and Bioanalysis, Medical University, 90-151 Lodz, Poland) **An iridoid from *Penstemon serrulatus* cultures.** *Phytochemistry*, v. 31(4): p. 1235-1237, 1992 (13 ref, Eng).

A new ester iridoid of the valeriana type, 7-desoxy-8-epi-valerosidate, has been isolated as its tetraacetyl derivative from calli and cell suspension cultures of *P.serrulatus*. The structure of this compound has been elucidated on the basis of its spectral data.

9204-2160 Yamada, Y., Shoyama, Y.*., Nishioka, I. (Faculty of Pharmaceutical Sciences, Kyushu University, 3-1-1 Maidashi, Higashi-ku, Fukuoka 812, Japan) **Characteristics of clonally propagated *Aconitum charmichaeli* Debx. by tissue culture.** *Shoyakugaku Zasshi*, v. 45(4): p. 289-292, 1991 (10 ref, Eng).

The homogeneity of aconitine-type alkaloids among the clonally propagated *A.charmichaeli* population was confirmed by the quanlitative HPLC analysis. It was shown than the quantities of aconitine-type alkaloids in the tubers are related to the harvesting time of tubers, and also the cultivation temperature. The mesaconitine and aconitine contents in tubers cultivated at 25degree C were higher than those cultivated at 15degree C. When the growth temperature was higher (25degree C), the ratio of mesaconitine content to aconitine content was lower and that of mesaconitine content to hypaconitine content was higher than those in the tubers cultivated at lower temperatures.

9204-2161 Yamaira, T., Tanaka, S., Tabata, M.* (Faculty of Pharmaceutical Sciences, Kyoto University, Yoshida, Kyoto 606, Japan) **Localization of the biosynthesis and accumulation of monoterpenoids in glandular trichomes of thyme.** *Planta Medica*, v. 58(2): p. 153-158, 1992 (15 ref, Eng).

Quantitative analyses of the essential oils in intact glandular trichomes isolated from *Thymus vulgaris* cotyledons by the use of an adhesive tape and a glass capillary tube showed that the content of thymol per cotyledon was approximately equal to the sum total of thymol in peltate glandular trichomes (PGTs) and capitate glandular trichomes (CGTs). The amounts of thymol and gamma-terpinene in PGTs increased with time until 9 days after germination, when these monoterpenes were exclusively found in PGTs. These results indicate that the biosynthesis and accumulation of monoterpenes in thyme seedlings take place primarily in PGTs.

9204-2162 Yamamoto, H., Ieda, K., Tsuchiya, S.I., Yan, K., Tanaka, T., Iinuma, M., Mizuno, M. (Department of Pharmacognosy, Gifu Pharmaceutical University, 6-1 Mitahorahigashi 5 Chome, Gifu 502, Japan) **Flavonol glycoside production in callus culture of *Epimedium diphyllum*.** *Phytochemistry*, v. 31(3): p. 837-840, 1992 (21 ref, Eng).

Callus cultures of *Epimedium diphyllum* produced a large amount of epimedoside A in addition to a small amount of diphylloside B, ikarisoside C, epimedoside E, diglycosides of des-O-methylanthroicaritin (8-gamma, gamma-dimethylallylkaempferol). Icariin, epimedins A-C, which are glycosides of anhydroicaritin, were also produced in the callus cultures. Contents of the flavonol glycosides in callus tissue were higher than those of mother plants, but the composition of each flavonol glycoside mixture in the callus cultures was different from that of the original plants. The time-course experiments showed that an inverse relationship existed between cell growth and flavonol glycoside production. Effects of hormonal factors on cell growth and flavonol glycoside production indicated that 2,4-dichlorophenoxyacetic acid was needed for the production of flavonol glycosides.

9204-2163 Yokoyama, M., Inomata, S., Seto, S., Yanagi, M. (Bio-Science Division, Shiseido Basic Research Laboratories, 1050 Nippa-cho, Kohoku-ku, Yokohama, 223, Japan) **Effects of sugars on the glucosylation of exogenous hydroquinone by *Catharanthus roseus* cells in suspension culture.** *Plant Cell Physiology*, v. 31(4): p. 551-555, 1990 (22 ref, Eng).

The effects of sugars on the glucosylation of exogenous hydroquinone (HQ) was investigated by supplying

individual sugars simultaneously with HQ to a suspension culture of *C. roseus* cells. The production of arbutin was enhanced as much as 2-to 3-fold by sucrose or glucose at concentrations of upto 6 percent, with the enhancement being directly dependent on the concentration of the sugar. The exogenously added sugar was not metabolized and remained unchanged. Sorbitol also promoted the production of arbutin in a similar manner. Sucrose improved the viability of cells and, in cultures supplied with sucrose and HQ, the activity of UDP-glucose:hydroquinone glucosyltransferase increased over a much longer period of time than that in control cultures supplemented with HQ only. JICST, Tokyo.

9204-2164 Yoshikawa, T., Furuya, T.(School of Pharmaceutical Sciences, Kitasato University, Shirokane, Minato-ku, Tokyo 108, Japan) **Production of useful compounds by ginseng hairy root cultures.** *7th Asian Symposium on Med. Plants, Spices, and Other Natural Prod. (ASOMPS VII).* Manila, 2-7 February 1992 (Eng).

In order to obtain new and more active compounds, biotransformation experiments to a variety of compounds were carried out using the hairy root culture of *Panax ginseng*. 2-phenylpropionic acid was biotransformed at about 90 percent ratio into the glucosy-, myo-inositol-and primeverosyl-esters, and the continuous glycosylation was performed for 2 months by the bioreactor using the hairy root culture. Digitoxigenin was biotransformed into 5 new compounds. Additionally, the hairy root biotransformed glycyrrhetic acid, aglycone of glycyrrhizine into 6 glycosides. (Abstr.No. W-2).

9204-2165 Zafar, R., Aeri, V., Datta, A.(Department of Pharmacognosy and Phytochemistry, Faculty of Pharmacy, Jamia Hamdard, Hamdard Nagar, New Delhi 110062, India) **Application of plant tissue and cell culture for production of secondary metabolites.** *Fitoterapia*, v. 63(1): p. 33-43, 1992 (80 ref, Eng).

The article reviews the present status and future prospects of plant tissue culture techniques for production of useful secondary plant metabolites. Plant cell cultures screened for novel, pharmacologically active compounds have been discussed.

Pharmacognosy

9204-2166 Afaq, S.H., Tajuddin, Afzali, R.(Department of Ilmul Advia, Faculty of Unani Medicine, Aligarh Muslim University 202,002, UP, India) **Biserhri booti (Aerva lanata Juss.) some lesser known uses and pharmacognosy.** *Ethnobotany*, v. 3(1&2): p. 37-40, 1991 (7 ref, Eng).

Ethnobotanical information on 'Bisehri Booti', has been recorded. It is used by the inhabitants in nephrological disorders. Macroscopic, microscopic and phytochemical studies on this dry have been done. It contains two glycosides, viz., kaempferol 3-galactoside and kaempferol-3-rhamno-galactoside, alkaloids, saponins, beta-sitosterol and sugars with large amount of minerals. NSL, New Delhi.

9204-2167 Baba, K., Taniguchi, M., Kozawa, M.(Osaka University of Pharmaceutical Sciences, 2-10-65 Kawai, Matsuura-city, Osaka 580, Japan) **A spirobiflavonoid genkwanol B from Daphne genkwa.** *Phytochemistry*, v. 31(3): p. 975-980, 1992 (3 ref, Eng).

A novel biflavanoid, genkwanol B was isolated from the roots of *D. genkwa*. The structure of genkwanol B was determined on the basis of chemical studies and spectroscopic data, including NOESY and HMBC experiments.

9204-2168 Bansiddhi, J.(Department of Medical Science, Thailand) **Characterization of some Phyllanthus species used to treat jaundice in Thailand.** *7th Asian Symposium on Med. Plants, Spices and Other Natural Prod. (ASOMPS VII).* Manila, 2-7 February 1992 (Eng).

'Luk-tai-bai', used in Thai traditional medicine to treat jaundice, is a group of plants in the genus *Phyllanthus*. Identification of plants called 'luk-tai'-bai', in the genus *Phyllanthus*, in Thailand was done. The study reveals that this group of plants is comprised of four species, namely *P. amarus*, *P. debilis*, *P. urinaria* and *P. virgatus*. (Abstr. No. TP-19).

9204-2169 Gbolade, A.A., Olayemi, J.O. , Elujoba, A.A., Sofowora, A., Adesina, S.K.(Department of Pharmacognosy, Faculty of Pharmacy, Obafemi Awolowo University, Ile-Ife, Nigeria) **Factors affecting the levels of steroid sapogenins in Nigerian Agave and Furcraea species.** *Fitoterapia*, v. 63(1): p. 45-48, 1992 (15 ref, Eng).

The factors influencing the yields of hecogenin and tigogenin in some *Agave* spp and *F. sellae* growing in Nigeria were investigated. These plants yielded more hecogenin in the dry season and when cultivated in the western and eastern zones. Intramorphological variations were observed for the leaves of the different plants, with the basal portion containing the highest amount of hecogenin. Leaves obtained from flowering plants were richer in this sapogenin than those from the non-flowering plants.

9204-2170 Guo, D.A., Lou, Z.C.(Department of Pharmacognosy, School of Pharmaceutical Sciences, Beijing Medical University, Xue Yuan Road, Beijing 100083, P.R.China) **Systematization and quality evaluation on traditional Chinese drug LOU-LU.** *7th Asian Symposium*

on Med. Plants, Spices, and Other Natural Prod. (ASOMPS VII). Manila, 2-7 February 1992 (Eng).

Lou-Lu is a Chinese crude drug traditionally used as a heat-clearing, detoxifying, antiinflammatory, pus-draining, lactation-promoting and anti-aging agent. Recent pharmacological studies showed Lou-Lu possesses anti-atherosclerotic, anti-peroxidant and immunopotentiating activities. Chinese Pharmacopoeia (1990 edition) specified Lou-Lu consists of the root of *Rhaponticum uniflorus*(L.) DC or *Echinops latifolius* Tausch. (Family Compositae). But according to the records in ancient Chinese herbals and recent literatures, over 20 plants from various genera and families were presumed as the original plants of Lou-Lu and used in different districts of China. For this reason, the following works were carried out by the authors. Critical study of ancient Chinese herbals has shown that only the root of *R. uniflorum* should be the true Lou-Lu and not that of *E. latifolius* or other *Echinops* spp. Morphological, histological and chemical studies of the roots of the above mentioned three plants were described and the results of the comparative studies listed. *Abstr. No. MO-12.*

9204-2171 Khan, G., Farooqi, M.I.H.(Natural Polymer Chemistry, National Botanical Research Institute, Lucknow 226001, UP, India) Chemical characterisation of resins sold in Indian markets. Part I. Luban and Kundur.. *International Journal of Pharmacognosy*, v. 29(4): p. 302-305, 1991 (8 ref, Eng).

Several samples of market resins sold under the names of Luban and Kundur were analysed. The Luban was found to be essentially gum benzoin from *Styrax* species and not the true Olibanum from *Boswellia* species. However, Kundur was the product of *Boswellia serrata* and therefore could be termed Indian Olibanum.

9204-2172 Liu, J.S., Huang, M.F.(Shanghai Institute of Materia Medica, Academia Sinica, 319 Yueyang Rd., Shanghai 200031, China) Kadsulignans E-G from *Kadsura longipedunculata*. *Phytochemistry*, v. 31(3): p. 957-960, 1992 (5 ref, Eng).

Three new lignans, kadsulignans E-G, with a spirodienone structure were isolated from the root bark of *K. longipedunculata*. The structures were elucidated by 2D 1H-13C long range COSY experiments and chemical conversions. The structures and mechanism of formation of their hydrolysis products are discussed.

9204-2173 Mikage, M., Lee, B.J., Park, J.H., Namba, T.(Faculty of Pharmaceutical Sciences, Kanazawa University, 13-1 Takaramachi, Kanazawa 920, Japan) Studies on the crude drugs from Korea (7). On the folk medicine

"Jad Na Mu Ip". *Shoyakugaku Zasshi*, v. 45(4): p. 336-341, 1991 (8 ref, Jap, Eng).

The Korean folk medicine "Jad Na Mu Ip" has been used to cure gonorrhea, syphilis, etc. Though the crude drug has generally been said to be the leaves of *Pinus koraiensis* of the Pinaceae family, the scientific confirmation has not been made yet. Recent commercial "Jad Na Mu Ip" certainly seems to be the leaves of a *Pinus* plant. Therefore, to identify the botanical origin of this crude drug, the leaves of seven species of the genus *Pinus* growing in Korea, Japan and China, including *P. koraiensis*, were examined anatomically.

9204-2174 Namba, T., Komatsu, K., Yamaji, S., Mikage, M.(Research Institute for Wakan-yaku, Toyama Medicinal and Pharmaceutical University, 2630, Sugitani, Toyama, 930-01 Japan) Pharmacognostical studies of the Tibetan crude drugs (5) On "rTag-ngu" and "Sum,-cu tig" derived from *Drosera* plants. *Journal of Japanese Botany*, v. 66(4): p. 235-244, 1991 (30 ref, Jap, Eng).

To clarify the botanical origins of two drugs obtained from Nepal, morphological and histological aspects were studied by comparing them with the whole plant of *D. peltata* collected in Nepal and Japan, and *D. indica* growing in Japan, India, etc. As the result, both of "rTag-ngu" and "Sum-cu tig" were proved to be derived from *D. peltata*.

9204-2175 Nayak, S.G.K., Iyengar, M.A.. *Strophanthus-a study of Indian market samples*. *Indian Drugs*, v. 29(6): p. 273-275, 1992 (2 ref, Eng).

Identifying characters and distinguishing features of *Strophanthus* seeds and pharmacognostical characters of *Holarrhena antidysenterica* seeds sold in the market, under the name of *Strophanthus* seeds have been discussed.

9204-2176 Qian, J., Hunkler, D., Rimpler, H.(Institut fur Pharmazeutische Biologie, Schanzlestrasse 1, D-7800 Freiburg, Germany) Iridoid-related aglycone and its glucosides from *Scrophularia ningpoensis*. *Phytochemistry*, v. 31(3): p. 905-911, 1992 (18 ref, Eng).

Besides the known compounds, aucubin and 6-O-methyl-catalpol, three new iridoid-related compounds, ningpogenin, ningpogoside A and ningpogoside B, were isolated from the hydrophilic extract of the air-dried roots of *S. ningpoensis*, by chromatographic methods. The structures and relative configuration of the new compounds were established mainly by mass spectrometry and NMR spectroscopy, including 2D-NMR and NOE techniques.

9204-2177 Thulin, M., Claeson, P.(Department of Systematic Botany, Uppsala University, Box 541, S-751 21 Uppsala, Sweden) The botanical origin of scented myrrh

(Bissabol or Habak Hadi). *Economic Botany*, v. 45(4): p. 487-494, 1991 (46 ref, Eng).

Based on literature reports and reviews, it is concluded that the botanical origin of scented myrrh (bissabol or habak hadi), a major article for export from Somalia since ancient times is *Commiphora guidottii* and not *C. erythraea* as generally has been presumed. The reasons for the previous confusion are discussed, and an updated synonymy and distribution map for *C. guidottii* are given.

9204-2178 Verghese, J. (Synthite Industrial Chemicals Ltd., Synthite Valley, Kolencherry 682311, Kerala, India) ***Garcinia cambogia* (Desr.)- Kodampuli.** *Indian Spices*, v. 28(1): p. 19-20, 1991 (13 ref, Eng).

Botanical characters, chemical constituents and therapeutic uses of *Garcinia cambogia* have been discussed.

9204-2179 Wu, Q.G. (South China Institute of Botany, China) **The anatomy of Chinese *Amomum* and *Alpinia*.** *Zingiberaceae Workshop, Prince of Songkla University, Hat Yai, Thailand*, p. 12-13, 15-18 Oct. 1991 (Eng).

The fruit and seed anatomy of 13 species and one variety of *Amomum* were studied. The important anatomical characters of the fruits are fruit wall structure, fruit vascular system, seed surfaces, seed oil pigments, have been described. These characters provide a basis for plant identification. Anatomical characters of fruit of the genus *Alpinia*, represented by 20 Chinese species have been described. The differences in fruit characters between *Amomum* and *Alpinia* have been discussed (Abstr. No. 1110-1150).

Clinical Studies

9204-2180 Anandan, T., Sivanandam, G., Suresh, A., Veluchamy, G. (Central Research Institute for Siddha, Madras 600106, TN, India) **Clinical trials of certain Siddha drugs in Padarthamarai (Dermatomycosis).** *Journal of Research in Ayurveda and Siddha*, v. 12(3-4): p. 172-180, 1991 (4 ref, Eng).

Relative efficacy of three Siddha drugs (Sivanaramirtham, Akasakarudan kizhangu churnam and sanguparpam) in the treatment of dermatomycosis patients has been discussed. Sivanaramirtham drug showed better result in Iyya and valitypes of diseases, while other two drugs were effective in Azhal type of the disease.

9204-2181 Jain, V., Pooma, A., Agarwal, R.P., Panwar, R.B., Kochhar, D.K., Mishra, S.N. (Department of Medicine, SP Medical College & PBM Hospital, Bikaner, Rajasthan, India) **Effect of *Terminalia arjuna* in patients of angina**

pectoris (A clinical trial). *Indian Medical Gazette*, v. 126(2): p. 56-59, 1992 (5 ref, Eng).

Twenty five patients of angina pectoris were kept on *T. arjuna* bark extract 500 mg bd along with the other anti-anginal drugs for 3 months. On revaluation at the end of one month and three months period it was found that treadmill test grading of positivity was reduced significantly and exercise tolerance of patients increased. However there was no significant reduction in consumption of antianginal drugs. No side effects of drugs were observed. NSL, New Delhi.

9204-2182 Kano, Y., Qine, Z., Komatsu, K.I. (Hokkaido Institute of Pharmaceutical Sciences, 7-1 Katuraoka-cho, Otaru 047-02, Japan) **On the evaluation of the preparation of Chinese medicinal prescriptions. VI. The changes of the alkaloid contents by processing of *Evodia* fruit.** *Yakugaku Zasshi*, v. 111(1): p. 32-35, 1991 (13 ref, Eng).

A crude drug, *Evodia* fruit (goshuyu) was processed to detoxicate and reduce the bitter taste. Following the procedure described in Shokanron, *Evodia* fruit was washed in hot water, and then dried. The alkaloid contents of processed *Evodia* fruit was analyzed by high performance liquid chromatography. The result showed that the content of hydroxyevodiamine decreased to 0.55 times, while the content of rutaecarpine and evodiamine hardly changes in the final processed material. However, evocarpine content increased to 1.3 times comparing with the untreated *Evodia* fruit. The phenomena was ascribed to the flowing-out of the water-soluble portion, and also the weight of extract and the intense of bitterness in the processed fruit were reduced to about 1/3 times.

9204-2183 Mitra, D.K. (Department of Medicine, BJ Medical College and Sasson Hospital, Pune 1, Maharastra, India) **Suhart vs. placebo in ischaemic heart disease.** *Medicine and Surgery*, v. 30(1&2): p. 33-34, 1991 (Eng).

Efficacy of indigenous medicine Suhart vs. placebo in the management of Ischaemic heart disease (IHD) has been studied. The main constituent of Suhart include, oil of nutmeg, oil of clove, *Piper nigrum*, *Balsamodendron mukul*, rose and kevda extracts, saffron, along with other main ingredients like Suvarna bhasma, abharak bhasma etc. 12 out of 13 patients on Suhart showed a significantly reduced angina frequency. Only 5 out of 13 patients on placebo improved. Patients taking Suhart were symptomally better than patients taking placebo. The frequency of angina was reduced and antianginal drug requirement was reduced.

9204-2184 Nair, P.R.C., Menon, T.V., Vijayan, N.P., Prabhakaran, V.A. (Indian Institute of Panchakarma, Chernthumthy, 679531, Kerala, India) **A comparative**

study of Patoltriphaladi and Pancatiktaka Kwatha Yogas in the treatment of Pama. *Journal of Research in Ayurveda and Siddha*, v. 12(3-4): p. 151-162, 1991 (5 ref, Eng).

Herbal preparations Patolatriphaladi yoga given internally and Tambuladi yoga applied externally vis-a-vis Pancatiktaka Kasaya Yoga administered internally and Nalpamaradi taila applied externally in eighty skin disease patients showed good results.

9204-2185 Pandey, P.N., Kishore, P.(Central Research Institute for Ayurveda, Unit I, Bhubaneswar 751009, Orissa, India) **Effect of Ayush-64 and Saptaparnaghana Vati on microfilaraemia.** *Journal of Research in Ayurveda and Siddha*, v. 12(3-4): p. 145-150, 1991 (6 ref, Eng).

Relative efficacy of herbal preparation Ayush-64 (containing *Alstonia scholaris*, *Swertia chirata*, *Picrorrhiza kurroa* and *Caesalpinea bonducella*) and Saptaparnaghana Vati on microfilaria patients has been reported. Saptaparnaghana Vati showed 86.6 percent efficacy while Ayush-64 showed 65.2 percent efficacy.

9204-2186 Singh, D.S., Gupta, S.S., Ansari, S.A., Singh, R.H. (Department of Medicine and Kayachikitsa, Institute of Medical Sciences, BHU Varanasi 221005, India) **Comparative study of Ayurvedic drugs Picrorrhiza kurroa (Kutaki) and Berberis aristata (Daru haridra) in acute viral hepatitis at Varanasi (India).** *Journal of Research and Education in Indian Medicine*, v. 10(4):p. 1-4, 1991 (7 ref, Eng).

A double blind controlled trial of *P.kurroa* and *B.aristata*. PID, New Delhi was conducted on 42 uncomplicated cases of acute hepatitis. It was observed that clinical and biochemical recovery was quicker in drug treated cases as compared to controls. Further, therapeutic response was superior in patients receiving *P.kurroa* than those receiving *B.aristata*. PID, New Delhi.

9204-2187 Sivaprakasam, K., Rao, K.K. , Yasodha, R., Veluchamy, G. (Central Research Institute for Siddha, Madras 600106, TN, India) **Effect of Kandankathiri in the management of Venkuttam (vitiligo).** *Journal of Research in Ayurveda and Siddha*, v. 12(3-4): p. 181-189, 1991 (10 ref, Eng).

Internal administration of choorn and external application of oil of *Solanum xanthocarpum* dried fruits were found to be effective in 106 patients of leucoderma.

Pharmacology & Toxicology

9204-2188 Abdalla, S., Aboudi, A., Abu Zarga, M., Sabri, S. (Department of Biological Sciences, University of Jor-

dan, Amman, Jordan) **Chemical analysis of Sternbergia clusiana and the effects of lycorine alkaloid on isolated guinea-pig pulmonary artery and heart.** *7th Asian Symposium on Med. Plants, Spices and Other Natural Prod.(ASOMPS VII). Manila*, 2-7 February 1992 (Eng).

Chemical analysis of the bulbs of *S.clusiana* resulted in the isolation for the first time of the following eight known alkaloids: lycorine, tazettine, galanthamine, haemanthamine, haemanthidine, 11-hydroxyvittatine, crinine and isotozettine. The biological effects of the major alkaloid lycorine were studied. These results suggest that the major alkaloid of *Sternbergia*, lycorine has potential cardiotonic and hemodynamic effects which are partially mediated by the stimulation of beta adrenoceptors. (Abstr. No. TP-22).

9204-2189 Aberer, W.(Department of Dermatology I, University of Vienna, Alserstrasse 4, A-1090 Vienna, Austria) **Occupational dermatitis from organically grown parsnip (Pastinaca sativa L.).** *Contact Dermatitis*, v. 26(1): p. 62, 1992 (7 ref, Eng).

Contact photodermatitis in 11 farm workers who weeded *P.sativa* fields has been reported. Tropical and systemic therapy with corticosteroids healed the patients.

9204-2190 Agarwal, K., Dhir, H., Sharma, A. , Talukder, G.(Centre of Advanced Study in Cell and Chromosome Research, Department of Botany, University of Calcutta, 35 Ballygunge Circular Road, Calcutta 700019, WB, India) **The efficacy of two species of Phyllanthus in counteracting nickel clastogenicity.** *Fitoterapia*, v. 63(1): p. 49-54, 1992 (32 ref, Eng).

Efficacy of *Phyllanthus emblica* (fruit aq. extract) and *P.niruri* (leaf aq. extract) in antagonising the clastogenic effects induced by nickel chloride in mouse bone marrow cells has been reported. Both the crude aqueous extracts effectively (p equal or less than 0.05) decreased the percentage of damaged cells as well as the frequency of breaks per cell induced by three doses of the metals salt (10,20 and 40 mg/kg body weight). The protection afforded by the plant extracts was possibly due to the combined effect of the natural constituents of the plant rather than to any single component. The data emphasise the importance of plant dietary supplements in alleviating metal cytotoxicity.

9204-2191 Ahmad, M., Asmawi M.(School of Pharmaceutical Sciences, Universiti Sains Malaysia, 11800 Minden, Penang, Malaysia) **A study of the hypoglycaemic property of Andrographis paniculata Nees.** *7th Asian Symposium on Med. Plants, Spices and Other Natural Prod.(ASOMPS VII). Manila*, 2-7 February 1992 (2 ref, Eng).

Hypoglycaemic testing on the anaesthetised rats proved to be negative since an oral dose of the aqueous extract (2 gm/kg) did not cause the lowering of the fasting blood glucose during the seven-hour testing. The same dose of the extract when given i.p. also failed to lower the blood glucose in glucose tolerance test. However, a significant decrease ($P < 0.05$) in blood glucose concentration was demonstrated on glucose tolerance test, as compared to the untreated group, when the extract was administered orally. In order to explain these discrepancies the in situ rat gut technique (Swintosky and Pogonowska-Wala, 1982) was adopted to study glucose absorption. This showed that the extract inhibits glucose absorption along the intestine. (Abstr. No. TP-12).

9204-2192 Al-Khalil, S., Afifi, F.U., Aqel, M.* (Faculty of Medicine, University of Jordan, Amman, Jordan) **The relaxing effect of an aqueous extract of *Glaucium arabicum* on uterine smooth muscle of rat and guinea pig.** *International Journal of Pharmacognosy*, v. 29(4): p. 241-244, 1991 (13 ref, Eng).

The effects of an aqueous extract of whole plant of *G. arabicum* on uterine smooth muscle of rat and guinea pig were tested in vitro using isolated uterine horns. The extract inhibited the spontaneous movement of the rat and guinea pig uterine smooth muscle. Also, the aqueous extract inhibited the contractions of rat and guinea pig uterine smooth muscle induced by oxytocin stimulation. This inhibition was dose-dependent and reversible. These data suggested that this plant extract has an antioxytocic effect.

9204-2193 Albania-Aquitania, L., Gomez-Cabrera, L. (Department of Physiology, DWU, Tacloban City, Philippines) **Comparative study on the sedative effects of Kogon and Manzanilla flowers.** *7th Asian Symposium on Med. Plants, Spices and Other Natural Prod. (ASOMPS VII)*, Manila, Philippines, 2-7 February 1992 (3 ref, Eng).

Certain extracts of flowers of Manzanilla, (*Chrysanthemum indicum*) and Kogon (*Imperata cylindrica*) were prepared and tested on 48 mice for sedative effects. Using the Modified Hippocratic Behavioral Observation Method. The 20 percent and 10 percent normal salt solutions of alcohol-free extract concentrates of fresh and dried Kogon flowers were more effective than corresponding preparations of Manzanilla. The potency of Kogon preparations were comparable to that of phenobarbital sodium except they were short-acting when given intraperitoneally. However, the orally administered decoctions of fresh and dried flowers and normal salt solutions of alcohol-free extracts of both plants exhibited similar results with that of the phenobarbital sodium. (Abstr. No. MP-15).

9204-2194 Alkiewicz, J., Makowska, M., Palka, E., Pic, S. (Pracownia Aerozoloterapii i Diagnostyki Czynnościowej Pluc, 1 Klinika Chorob Dzieci, Instytut Pediatrii, Akademia Medyczna, ul. Szpitalna 27/33, 60-572 Poznań, Polska) **Comparative pharmacokinetic studies of alpha-pinene inhalant solutions.** *Herba Polonica*, v. 36(3): p. 111-116, 1990 (Recd. 1992, 5 ref, Pol, Eng).

Comparative studies of dynamics of absorption, elimination and bioavailability of water-alcoholic solubilized alpha-pinene inhalant solutions have been carried out. It was observed that water-alcoholic solution is absorbed and eliminated considerably quicker than solubilized solution. The bioavailability of these solutions is 35 percent smaller. The studies indicate that alpha-pinene solubilized solution is better pharmaceutical forms for inhalation than water-alcoholic one.

9204-2195 Ammon, H.P.T., Anazodo, M.I., Safayhi, H., Dhawan, B.N., Srimal, R.C. (Department of Pharmacology, Institute of Pharmacy, University of Tübingen, D (W)-7400 Tübingen, Federal Republic of Germany) **Curcumin: A potent inhibitor of leukotriene B formation in rat peritoneal polymorphonuclear neutrophils (PMNL).** *Planta Medica*, v. 58(2): p. 226, 1992 (7 ref, Eng).

The effect of curcumin, an active principle of *Curcuma longa* on leukotriene formation using PMNL has been investigated. Curcumin exhibited no cytolytic effect on PMNL within the concentration used in this study as assessed with the trypan blue exclusion test. However, a concentration-dependent inhibition of the calcium/calcium ionophore stimulated formation of LTB4 was observed.

9204-2196 Anand, K.K., Singh, B., Chand, D., Chandan, B.K. (Department of Pharmacology, Regional Research Laboratory, Canal Road, Jammu Twai 180001 India) **An evaluation of *Lawsonia alba* extract as hepatoprotective agent.** *Planta Medica*, v. 58(1): p. 22-25, 1992 (30 ref, Eng).

The hepatoprotective activity of an ethanol-water (1:1) extract of *L. alba* has been studied against CCl4-induced liver toxicity. The effects of the extract on hexobarbitone-induced sleep, BSP clearance, and on certain biochemical parameters indicated its protective role. There was no effect on bile flow. The extract did not show any signs of toxicity and the minimum lethal dose was greater than 2.0g/kg p.o. in mice.

9204-2197 Aramaki, S., Suzuki, E.* , Ishidaka, O., Momose, A., Umemura, K. (Laboratory of Racing Chemistry, 4-37-6-Kamiyoga, Setagaya-ku, Tokyo 158, Japan) **Pharmacokinetics of caffeine and its metabolites in horses after intravenous, intramuscular or oral**

administration. *Chemical & Pharmaceutical Bulletin*, v. 39(11): p. 2999-3002, 1991 (10 ref, Eng).

The pharmacokinetics of caffeine (CAF contained in many beverages) and its metabolites, dimethylxanthines, were examined in horses administered 2.5mg/kg of CAF intravenously, intramuscularly, or orally. The plasma samples were extracted by Extrelut and the concentrations of CAF and metabolites were determined by HPLC with a short column. The biologic half lives of CAF were 15.5, 18.6, and 16.4h after administering i.v., i.m. and p.o., respectively. The extent of the bioavailability of the p.o. administration was determined as 1.04 times the dose. The differences in pharmacokinetic parameters were not statistically significant among administration routes. A straight correlation existed between the logarithms of body weights of different species of animals and those of their biologic half lives of CAF. Therefore, the biologic half life of CAF in an animal might be predictable as a function of its body weight.

9204-2198 Arambewela, L.R., Madawela, P.G.(Ceylon Institute of Scientific & Industrial Research, PO Box 787, Colombo, Sri Lanka) **Studies on Rauvolfia canescens.** *7th Asian Symposium on Med. Plants, Spices and Other Natural Prod.(ASOMPS VII)*. Manila, 2-7 February 1992 (2 ref, Eng).

Phytochemical studies on *R.canescens* indicated the presence of indole alkaloids yohimbine alpha-yohimbine, reserpiline, isoreserpiline aricine, ajmaline, corynanthine, deserpidine, isoreserpine and a new compound lankanesicine in the leaves and roots of the plant. The polyvinylpyrrolidone coprecipitate of the crude alkaloid extract of the plant caused a significant sedative action in rats (i.p.). The antibacterial activity of the crude alkaloid extracts was studied on *Staphylococcus aureus*, *Pseudomonas aeruginosa* and *E.coli*. A marked inhibition was observed for *S.aureus* and *E.coli*. (Abstr. No. TO-8).

9204-2199 Banerjee, R.S., Samanta, A.R., Dey, A., Senapati, P.K., Ghosh, T.K.(Department of Gynaecology and Obstetrics, Bidhan Chandra Krishi Vishwavidyalaya, Mohanpur, Nadia, Calcutta, WB, India) **Effect of feeding Livol as a growth promoter in Japanese quail.** *Indian Journal of Indigenous Medicines*, v. 8(1): p. 45-49, 1991 (2 ref, Eng).

An experiment of six weeks duration was conducted to evaluate the effect of LIVOL supplementation in feed on growth of "Japanese Quail". The groups consisted of two levels of LIVOL, 0.25 percent and 0.5 percent of the diet and one group served as control. The body weight and feed efficiency of LIVOL supplemented groups were significantly (P) superior to control group. Among the two

levels of LIVOL tested, the body weight of birds in 0.5 percent group was superior as compared to 0.25 percent level of LIVOL. Feed efficiency was also better in 0.5 percent group than control and 0.25 percent.

9204-2200 Barbosa, P.P.P., Ramos, C.P.(Departamento de Fisiologia, Centro de Ciencias Biologicas, Universidade Federal de Alagoas, Maceio, Alagoas, Brazil 57000) **Studies on the antiulcerogenic activity of the essential oil of *Hyptis mutabilis* Briq. in rats.** *Phytotherapy Research*, v. 6(2): p. 114-115, 1992 (4 ref, Eng).

The volatile oil of *H.mutabilis*, was investigated for its ability to prevent or reduce the formation of ulcerations in the gastric mucosa of male rats induced by indomethacin subcutaneous injection. When previously administered (p.o. and i.p.) the oil (F1473; 50-100 mg/kg) significantly reduced gastric alterations produced by indomethacin in a dose-dependent fashion. However, the mechanism of action of this oil is still unknown..

9204-2201 Barret, Y., Sauvaire, Y.(Laboratoire de Physiologie Vegetale, Universite Montpellier II, 34095, Montpellier Cedex, France) **Fagaronine, a novel antileukaemic alkaloid.** *Phytotherapy Research*, v. 6(2): p. 59-63, 1992 (28 ref, Eng).

A review is presented about fagaronine, a benzophenanthridine alkaloid responsible for antitumoural activity. Plant source, extraction, biosynthesis, medicinal properties, especially antileukaemic activity, are described.

9204-2202 Baskar, R., Varalakshmi, P. , Amsaveni, R.(Department of Medical Biochemistry, PG Institute of Basic Medical Sciences, Taramani, Madras 600 113, TN, India) **Changes in tissue enzymes produced by Coleus aromaticus in experimental urolithiasis.** *Indian Drugs*, v. 29(6): p. 254-258, 1992 (27 ref, Eng).

C.aromaticus leaf juice (at the rate of 1 ml/rat/day) for 10-30 days was administered in experimental urolithiatic rats. Reduction in the deposition of calcium and oxalate in the kidney tissue has been reported. Certain enzyme systems, implicated in the process of calcification like ATPases and phosphohydrolases were affected by the extract, suggesting its regulatory influence on calcium oxalate stone formation.

9204-2203 Caparrotta, L., Pandolfo, L. , Froldi, G., Chinellato, A., Ragazzi, E. , Biasi, M.De, Fassina, G.(University of Padua, Department of Pharmacology, Largo E. Meneghetti 2,35100 Padova, Italy) **Droseraceae naphthoquinones, different pharmacological profile.** *7th Asian Symposium on Med. Plants, Spices and Other Natural*

Prod.(ASOMPS VII). Manila, Philippines, 2-7 February 1992 (Eng).

Plumbagin (2-methyl-5-hydroxy-1,4-naphthoquinone), purified from different species of *Drosera* was separately studied on tracheal and atrial preparations. Isolated chains from rabbit and guinea pig were used as in vitro experimental models. On guinea pig trachea, plumbagin (0.1-5 microM) caused a contraction followed by relaxation, whereas 7-methyljuglone on the same concentration caused only contraction. Pyrilamine 0.3 microM (a H1-receptor antagonist) completely antagonized plumbagin and only partially inhibited 7-methyljuglone effects. On isolated rabbit trachea, both plumbagin and 7-methyljuglone only produced relaxing response. On isolated guinea pig atria, plumbagin and 7-methyljuglone evidenced similar activity. Initial reduction of contractile tension followed by positive inotropic and chronotropic effects, causing atrial arrest at the highest concentrations. (Abstr. No. MP-12A).

9204-2204 Chawla, A.S., Sharma, A.K., Handa, S.S.(Department of Pharmaceutical Sciences, Panjab University, Chandigarh 160014, India) **Chemical investigation and anti-inflammatory activity of Vitex negundo seeds.** *Journal of Natural Products*, v. 55(2): p. 163-167 , 1992 (11 ref, Eng).

Chloroform extract of the defatted seeds of *V.negundo* exhibited anti-inflammatory activity and yielded four triterpenoids: 3beta-acetoxylean-12-en-27-oic acid (1) 2alpha,3alpha-dihydroxyoleana-5,12-dien-28-oic acid (2), 2beta,3alpha-diacetoxyleana-5,12-dien-28-oic acid(3), and 2alpha,3beta-diacetoxy-18-hydroxyoleana-5,12-dien-28-oic acid (5). This is the first report of the isolation of compounds 2,3 and 5 from a natural source.

9204-2205 Chen, K., Shi, Q., Kashiwada, Y., Zhang, D.C., Hu, C.Q. , Jin, J.Q. , Nozaki, H., Kilkuskie, R.E., Tramontano, E., Cheng, Y.C., McPhail, D.R., McPhail, A.T.* , Lee, K.H.(Department of Chemistry, Paul M Gross Chemical Laboratory, Duke University, Durham, North Carolina 27706, USA) **Anti-aids agent, 6. Salaspermic acid, an anti-HIV principle from *Tripterygium wilfordii*, and the structure-activity correlation with its related compounds.** *Journal of Natural Products*, v. 55(3): p. 340-346 , 1992 (20 ref, Eng).

Salaspermic acid (1), an inhibitor of HIV reverse transcriptase and HIV replication in H9 lymphocyte cells, was isolated from the roots of *T.wilfordii* for the first time. The structure of 1 derived from spectral data was established unequivocally by an X-ray analysis of crystals of the monohydrate. A structure-activity correlation of 1 with ten related compounds indicated that the acetal linkage in ring

A and the carboxyl group in ring E of 1 may be required for the anti-HIV activity.

9204-2206 Chhajed, S., Baghel, M.S. , Ravishankar, B., Gurdip Singh(Department of Kayachikitsa Institute for PG-T and Research, Gujarat Ayurved University, Jamnagar 361008, Gujarat, India) **Evaluation of hepatoprotective effect of *Piper longum* (Pippali) and *Withania somnifera* (Ashvagandha) in hepatotoxicity induced by antitubercular drugs in mice.** *Journal of Research and Education in Indian Medicine*, v. 10(3): p. 9-12, 1991 (5 ref, Eng).

Effect of concomitant administration of *P.longum* and *W.somnifera*, the Rasayana drugs, produced marked histopathological changes in induced hepatotoxicity. Results indicate that Rasayana drugs can be used as important adjuvants with anti tubercular drug therapy..

9204-2207 Choudhary, Ch.(Poultry Pathologist, Veterinary Biological & Research Institute, Hyderabad, AP, India) **Aflatoxicosis in broiler chicks-a clinical drug trial with livol liquid.** *Indian Journal of Indigenous Medicines*, v. 8(1): p. 91-94, 1991 (7 ref, Eng).

A clinical trial with LIVOL liquid, was conducted on these selected broiler farms affected with aflatoxicosis. The LIVOL liquid was administered at the dose rate of 2.5 ml/litre of drinking water for the whole day for 7 days after withdrawing aflatoxin contaminated feed. The clinical manifestation of aflatoxicosis gradually disappeared and FCR improved. The protein utilisation and fat absorption improved in LIVOL treated flocks.

9204-2208 Choudhary, Ch.(Veterinary Biological & Research Institute, Hyderabad, AP, India) **Aflatoxicosis in layer birds- A clinical drug trial with livol liquid.** *Indian Journal of Indigenous Medicines*, v. 8(1): p. 31-37, 1991 (4 ref, Eng).

The clinical manifestation with necropsy findings in affected birds were recorded. Livol liquid was tried to study the efficacy of the product in three affected farms at the dose rate of 2.5 ml/litre of drinking water for whole day for 7 days after replacing the aflatoxin contaminated feed with wholesome feed. Within 5 days the egg production started increasing whereas in control group there was no improvement in egg production.

9204-2209 Chu, S.C., Hsieh, Y.S., Lin, J.Y.* (Institute of Biochemistry, College of Medicine, National Taiwan University, Taipei 10018, Taiwan, Republic of China) **Inhibitory effects of flavonoids on Moloney murine leukemia virus reverse transcriptase activity.** *Journal of Natural Products*, v. 55(2): p. 179-183 , 1992 (19 ref, Eng).

Several flavonoids were tested for their effects on Moloney murine leukemia virus reverse transcriptase activity. Four groups of flavonoids, namely flavones, flavanones, flavonols, and flavanonols, were studied, and it was found that flavonols and flavanonols were very active in this regard while flavones and flavanones displayed very low activity. Among the flavonoids tested, fisetin, quercetin, myricetin, kaempferol, morin (+)-taxifolin, (+)-catechin, and (-)-epicatechin were shown to be highly effective in inhibiting the reverse transcriptase activity. Structure-activity relationship analysis of these flavonoids have been made.

9204-2210 Chung, S.H., Choi, J.J., Yoo, K.S., Yun-Choi, H.S.* (Natural Products Research Institute, Seoul National University, Seoul 110-460, Korea) **Bradykinin antagonistic activities of Scutellariae Radix.** *Korean Journal of Pharmacognosy*, v. 22(3): p. 192-196, 1991 (24 ref, Kor, Eng).

Ether-soluble flavonoid and neutral fraction prepared from EtOAc extract of Scutellariae Radix showed inhibitory activities against bradykinin (BK); inhibited BK-induced ileum or uterus contractions, antagonized BK-induced plasma extravasation and protected mice from endotoxic shock, reduced acetic acid-induced writhing in mice.

9204-2211 Conti, M., Cristoni, A., Magistretti, M.J. (Inverni della Beffa S.p.A Research and Development Laboratories, via Ripamonti 99, 20141 Milan, Italy) **Activity of delphinidin on microvascular damage models in rodents.** *Phytotherapy Research*, v. 6(2): p. 99-103, 1992 (26 ref, Eng).

Delphinidin chloride (IdB 1056) was found to possess a significant activity by the i.p. and oral routes in different experimental models of microvascular damage. It antagonized the increase in skin capillary permeability induced by histamine in rats and rabbits, by bradykinin and hyaluronidase in rats and by xylol in mice. Significant increases in skin capillary resistance were observed after a 3-day oral dosing in guinea-pigs and rats. A significant enhancement in cutaneous wound healing rate was found with a 10-day oral treatment in rats made locally ischaemic. Delphinidin showed a low acute toxicity by the oral route.

9204-2212 De Padua, L.S. (Institute of Biological Sciences, College of Arts & Sciences, University of the Philippines at Los Banos College, Laguna, Philippines) **Philippine medicinal plants in animal health care: An update.** *7th Asian Symposium on Med. Plants, Spices and Other Natural Prod. (ASOMPS VII)*. Manila, 2-7 February 1992 (Eng).

Based on a national survey an integrated program on recent developments on the utilization of Philippine

medicinal plants for livestock and poultry production, aimed at benefitting the small farmer have been presented. (Abstr.No. WP-22).

9204-2213 Dias, M., Vale, T. (Servico de Dermatologia, Hospital Curry Cabral, Rue da Beneficencia, 1000 Lisboa, Portugal) **Contact dermatitis from a Dalbergia nigra bracelet.** *Contact Dermatitis*, v. 26(1): p. 61-62, 1992 (9 ref, Eng).

Case of a 55 year-old woman who developed an acute itchy erythematous papulovesicular dermatitis at the mid-left forearm, where her skin was in close contact with a wooden bracelet that she had worn for week is described. On patch testing with saw dust of bracelet (prepared from *D.nigra* wood) showed a positive reaction.

9204-2214 Duh, C.Y., Kinghorn, A.D., Pezzuto, J.M. (Program for Collaborative Research in the Pharmaceutical Sciences, Department of Medicinal Chemistry and Pharmacognosy, College of Pharmacy, University of Illinois at Chicago, Chicago IL 60612, USA) **Cell-cycle specific cytotoxicity mediated by stizophyllin (2alpha,2beta,12beta-trihydroxypregna-4,7,16-trien-20-one), a novel electrophilic pregnane isolated from Stizophyllum riparium.** *Chemico-Biological Interactions*, v. 80(1): p. 43-56, 1991 (23 ref, Eng).

Detailed isolation procedure and mechanism of action of a structurally novel pregnane derivative stizophyllin, isolated from *S.riparium* plant extract have been discussed. Stizophyllin interacted with DNA but no mutagenicity was observed with *Salmonella typhimurium* strain TM 677 or cultured Chinese hamster ovary cells. Relative to control cell cultures, the total biosynthesis of DNA, RNA or protein was reduced when P-388 cells were treated with stizophyllin. IARI, New Delhi.

9204-2215 Egert, D., Beuscher, N. (Schaper & Brummer, D(W)-3320 Salzgitter 61, Federal Republic of Germany) **Studies on antigen specificity of immunoreactive arabinogalactan proteins extracted from *Baptisia tinctoria* and *Echinacea purpurea*.** *Planta Medica*, v. 58(2): p. 163-165, 1992 (10 ref, Eng).

Using the antigen-antibody reaction in a competitive ELISA it was evident that antibodies against glycoproteins from *B.tinctoria* were specific because none of the other antigens like those from *E.purpurea*, *Thuja occidentalis*, arabinogalactan from larch, LPS from *E.coli* 0:55:B5, and from *Salmonella typhimurium* were able to inhibit the antigen-antibody reaction. The same results were obtained from ELISA experiments with *E.purpurea*. From these studies it was concluded that the antigenic regions of im-

munoreactive proteins from both medicinal plants show structural differences.

9204-2216 Elisabetsky, E., Figueiredo, W., Oliveria, G. (Departamento de Farmacologia, Universidade Federal do Rio Grande do Sul, 90,050 Porto Alegre RS, Brazil) **Traditional Amazonian nerve tonics as antidepressant agents: Chaunochiton kappleri, a case study.** *Journal of Herbs, Spices & Medicinal Plants*, v. 1(1&2): p. 91-114, 1992 (109 ref, Eng).

This review explores the available ethnopharmacological data related to nerve tonics in order to suggest plant species with potential antidepressive activity and to elucidate a phytopharmacological screening method that could be used to assay for antidepressive activity. Antidepressive properties of *C. kappleri*, a plant of the Amazon, are also reviewed.

9204-2217 Erdelmeier, C.A.J., Regenass, U., Rali, T., Sticker, O. (Department of Pharmacy, Swiss Federal Institute of Technology (ETH) Zurich, CH-8092 Zurich, Switzerland) **Indole alkaloids with in vitro antiproliferative activity from the ammoniacal extract of Nauclea orientalis.** *Planta Medica*, v. 58(1): p. 43-48, 1992 (13 ref, Eng).

Nine angustine-type alkaloids were isolated from ammoniacal extracts of *N.orientalis*. The structures of the isolates were determined with spectroscopic method, mainly 1D- and 2D-NMR spectroscopy. The compounds were found to exhibit in vitro anti-proliferative activity against the human bladder carcinoma T-24 cell line and against EGF (epidermal growth factor)-dependent mouse epidermal keratinocytes. By using overpressure layer chromatography, it was shown that minor quantities of these alkaloids occur in dried *N.orientalis* leaves. The use of ammonia in the extraction process results in a significant increase in the formation of angustine-type alkaloids from strictosamide-type precursors.

9204-2218 Farah, M.H., Samuelsson, G. (Department of Pharmacognosy, Uppsala University, Biomedical Center, Box 579, S-75123 Uppsala, Sweden) **Pharmacologically active phenylpropanoids from Senra incana.** *Planta Medica*, v. 58(1): p. 14-18, 1992 (25 ref, Eng).

Coniferaldehyde, scopoletin, sinapaldehyde, and syringaldehyde were isolated from an aqueous extract of *S.incana*. All four compounds inhibited prostaglandin synthetase in a dose-dependent way. Compared to aspirin, the potency of coniferaldehyde and scopoletin was about five times higher, whereas syringaldehyde and sinapaldehyde and about half the potency of this reference compound. On topical application, sinapaldehyde and scopoletin dose-de-

pendently inhibited ethyl phenylpropiolate-induced edema of the rat ear. The active dose range was 1-10 micro/ear. Higher doses had a lower effect. Syringaldehyde was active in the range 20-100 micro/ear, whereas the effect of coniferaldehyde was inconclusive. Coniferaldehyde and sinapaldehyde inhibited electrically induced contractions of the guinea pig ileum in a dose-dependent way. Syringaldehyde showed a weak inhibition at a concentration of 550 micro/M.

9204-2219 Fernandez, T.J., Rojas, R.F.Jr. **Local plants as anthelmintic for animals.** *7th Asian Symposium on Med. Plants, Spices and Other Natural Prod. (ASOMPS VII)*. Manila, 2-7 February 1992 (Eng).

A preliminary screening on the efficacy of some local plants used by local farmers for the treatment of endoparasites in animals was undertaken. Eighteen local plants identified by farmers to have potential anthelmintic effect were tested. Of these plants only 10 plants were effective against *Ascaridia galli*, 6 against *Ascaris suum*, and 8 against *Haemonchus contortus*. (Abstr.No. WP-21).

9204-2220 Ghosal, S. (Pharmaceutical Chemistry Research Laboratory, Department of Pharmaceutics, Banaras Hindu University, Varanasi, UP, India) **Natural products with immunological effects.** *Indian Journal of Indigenous Medicines*, v. 8(1): p. 1-7, 1991 (27 ref, Eng).

The immunologic effects of a range of low and medium molecular weight secondary metabolites, e.g. glycosylated phytosteroids, phenolics, acetogenins and alkaloids, are described. These compounds were isolated from Indian medicinal plants reputed for similar purposes (Rasayan meaning rejuvenator/immunomodulator) in Indian systems of medicine. The clinical potential of these compounds in modern medicine is also appraised.

9204-2221 Gilani, A.H., Janbaz, K.H. (Department of Pharmacology, The Aga Khan University Medical College, Karachi 74800, Pakistan) **Hepatoprotective activity of Rubia cordifolia against paracetamol-induced hepatotoxicity.** *7th Asian Symposium on Med. Plants, Spices and Other Natural Prod. (ASOMPS VII)*. Manila, 2-7 February 1992 (Eng).

The hepatoprotective effect of methanolic extract of *R.cordifolia* against liver damage in an experimental model of hepatic damage caused by paracetamol, is described. Results show that paracetamol caused liver damage as manifested by the rise in serum GOT and GPT levels compared to values in control group. Pretreatment of animals with plant extract significantly reduced the enzyme levels (P). These data indicate that alcoholic extract of *R.cordifolia*

provides protection against paracetamol-induced liver damage in rats. (Abstr. No. TP-20).

9204-2222 Guevara, A.P., Cancio, E., Gonzales, M.C., Alipudin, S.J.(Institute of Chemistry, College of Science University of the Philippines) **Isolation and characterization of an antimutagen from Plumeria acutifolia Pior.** *7th Asian Symposium on Med. Plants, Spices, and Other Natural Prod. (ASOMPS VII). Manila, 2-7 February 1992* (Eng).

Freshly picked, mature, green leaves of *P.acutifolia* (Kalachuchi) were extracted with distilled ethanol and partitioned between solvents of varying polarity. The resulting hexane extract, carbon tetrachloride extract, and methanol extract were bioassayed for antimutagenic activity using the micronucleus test. Bioassay results indicated that the carbon tetrachloride extract was antimutagenic. This extract was fractionated by repeated and sequential flash column chromatography. Three of the TLC-pure isolates exhibited antimutagenic activity. One of these is a triterpenoid derivative. (Abstr. No. TP-18).

9204-2223 Gumbinger, H.G., Winterhoff, H., Wylde, R., Sosa, A.(Institut fur Pharmakologie und Toxikologie der Universitat, Domagkstr. 12,D(W)-4400 Munster, Federal Republic of Germany) **On the influence of the sugar moiety on the antigenadotropic activity of luteoline glycosides.** *Planta Medica*, v. 58(1): p. 49-50, 1992 (9 ref, Eng).

Luteolin-7-glucoside and luteolin-7-glucuronide were isolated from *Lycopus europaeus* L. (Lamiaceae) and identified by 1H-and 13C-NMR spectroscopy. Luteolin-7-glucuronide proved to be active against pregnant mare serum gonadotropin in vitro as well as in vivo, whereas the other flavone glycosides occurring in the plant were completely inactive.

9204-2224 Gupta, R.S., Dixit, R.S.(Reproduction Physiology Section, Department of Zoology, University of Rajasthan, Jaipur 302004, Rajasthan, India) **Antispermatogenic effects of aloin (C21H32O9) in presbytis langurs with special reference to leydig cell and testicular cell population dynamics.** *Indian Biologist*, v. 23(1): p. 33-38, 1991 (Recd. 1992; 20 ref, Eng).

Aloin, a glycoside from the leaves of *Aloe barbadensis*, was administered to presbytis langurs (62.5 mg/kg body wt/day for a period of 4 months. Aloin exerts its effect of spermiogenesis at stage 10-14. A significant reduction in spermatid cell population (33.68 percent), seminiferous tubules and leydig cell nuclear dimensions did occur. No significant change was found in the population of spermatogonia/primary and secondary spermatocytes. The

productions of mature leydig cells were decreased by 50.5 percent, whereas the precursor of leydig cell population did not change indicating a+ve step towards self renewal of steroidogenesis after cesations of aloin administration. NSL, New Delhi.

9204-2225 Hafner, J., Riess, C.E., Wuthrich, B.(Dermatologic Clinic, Allergy Unit, University Hospital Zurich, 8091 Zurich, Switzerland) **Protein contact dermatitis from paprika and curry in a cook.** *Contact Dermatitis*, v. 26(1): p. 51-52, 1992 (12 ref, Eng).

Case of a 60 year-old man who showed negative patch tests and very strong positive skin prick test (SPT) and scratch-chamber tests to paprika and curry in described. SPT revealed no cross sensitivity to other common species of Solanaceae. SPTs were negative for coriander and pepper (constituents of curry powder). Very high circulating specific IgE was observed for paprika but not for curry, veal or melon.

9204-2226 Harmala, P., Vuorela, H., Tornquist, K., Hiltunen, R.(Pharmacognosy Division, Department of Pharmacy, University of Helsinki, Fabianinkatu 35, SF 00170 Helsinki, Finland) **Choice of solvent in the extraction of Angelica archangelica roots with reference to calcium blocking activity.** *Planta Medica*, v. 58(2): p. 176-183, 1992 (23 ref, Eng).

Twenty solvents were tested in the extraction of compounds from the roots of *A.archangelica*. The calcium antagonistic effect of the extracts was investigated by measuring the inhibition of depolarization-induced Ca²⁺ uptake in rat pituitary GH4C1 cells. Chloroform was found to be the best solvent for the extraction of nonpolar, biologically active compounds from the roots of *A.archangelica*.

9204-2227 Hausen, B.M., Evers, P., Stuwe, H.T., Konig, W.A., Wollenweber, E.(Department of Dermatology, University Hospital, Martinistraße 52, D-2000 Hamburg 20, Germany) **Propolis allergy (IV). Studies with further sensitizers from propolis and constituents common to propolis, poplar buds and balsam of Peru.** *Contact Dermatitis*, v. 26(1): p. 34-44, 1992 (39 ref, Eng).

Twenty-six different compounds have been investigated experimentally for their sensitizing capacity in guinea pigs. 19 of these occur in propolis as well as in polar (*Populus*) bud exudates, and 14 of them are also found in balsam of Peru. Four caffeoates and benzyl isoferulate were found to be strong sensitizers. Seven compounds were moderate and 13 compounds showed only weak sensitizing potency. Patch tests in 11 propolis-sensitive patients once more revealed 3-methyl-2-butenyl caffeoate and phenylethyl caffeoate as the major sensitizers. Five new substances com-

mon to both propolis and balsam of Peru have been identified. Among these, benzyl isoferulate is considered a noteworthy sensitizer. The flavonoid aglycones occurring in poplar bud exudates, and hence also in propolis, are weak sensitizers which play only a minor role in propolis hypersensitivity.

9204-2228 Hsu, F.L., Cheng, J.T.(Graduate Institute of Pharmaceutical Sciences, Taipei Medical College, Taipei City, Republic of China) **Investigation in rats of the antihyperglycaemic effect of plant extracts used in Taiwan for the treatment of diabetes mellitus.** *Phytotherapy Research*, v. 6(2): p. 108-111, 1992 (12 ref, Eng).

In order to clarify the hypoglycaemic activity of plants that are widely used to treat diabetes mellitus in Taiwan, the present study investigated the effectiveness of ten plant extracts by screening the decrease of blood glucose level in streptozocin-induced diabetic rats. Only six plant extracts exhibited blood glucose lowering activities in the rat. Blood levels of insulin were also determined using radioimmunoassay methods. Lack of an increase of insulin-like immunoreactivity in rats treated with these six plant extracts ruled out the mediation of insulin-dependent mechanisms. Similar effects were also observed in glucose-challenged rats treated with these extracts. The results confirmed the hypoglycaemic activity of these plants and suggested that this action was produced through an insulin-independent mechanism.

9204-2229 Huang, Q., Matsuda, H., Sakai, K., Yamahara, J., Tamai, Y.(Kyoto Pharmaceutical University, Misasagi, Yamashina-ku, Kyoto 607, Japan) **The effect of ginger on serotonin induced hypothermia and diarrhoea.** *Yakugaku Zasshi*, v. 110(12): p. 936-942, 1990 (21 ref, Eng).

One of the important medicinal properties of ginger is known to remove chills caused by common cold and to warm body. Acetone extract of ginger at 100 mg/kg p.o significantly inhibited serotonin (5-HT) induced hypothermia. The active constituents of ginger were further examined. The acetone extract was fractionated into 4 fractions by column chromatography. Fractions 1 and 2 showed significant activity. Fraction 2 was further purified and {6}-shogaol which was obtained from fraction 2-2, at 10 mg/kg p.o. was shown to inhibit 5-HT induced hypothermia. Anticathartic activity is known to be one of the medicinal effects of ginger. Acetone extract of ginger at 75 mg/kg p.o., significantly inhibited 5-HT induced diarrhoea. In order to clarify the active constituents, the acetone extract was fractionated into 4 sections. Fractions 2 and 3 which were especially effective, were further purified and {6}-shogaol, {6}-dehydrogingerdione, {8}- and {10}-gingerol were

found to have an anticathartic action. {6}-Shogaol was more potent than {6}-dehydrogingerdione, {8}- and {10}-gingerol.

9204-2230 Hudson, J., Towers, G.H.N.(Division of Medical Microbiology, University of British Columbia, 2733 Heather Street, Vancouver, BC V6T 1W5 Canada) **Anti-aids virus (HIV) compounds from plants.** *7th Asian Symposium on Med. Plants, Spices and Other Natural Prod.(ASOMPS VII). Manila*, 2-7 February 1992 (2 ref, Eng).

Specific compounds, extracted and identified by standard phytochemical techniques, were reacted with the virus (HIV-1) either before or after inoculation into cell cultures. Infectious virus or infected cells were monitored by the measurement of i) viral cytopathic effects (cpe; syncytium formation); ii) fluorescent antibody-staining cells; and iii) production of viral p24 antigen (by Elisa). Among the compounds tested, alpha-terthienyl (from *Tagetes* sp., hypericin (a complex anthraquinone from *Hypericum* sp. were found to possess potent anti-HIV activity. (Abstr. No. TO-17).

9204-2231 Inamori, Y., Ogawa, M., Tsujibo, H., Baba, K., Kozawa, M., Nakamura, H.(Osaka University of Pharmaceutical Sciences, Kawai, Matsubara-shi, Osaka 580, Japan) **Inhibitory effects of 3,3',4,5'-tetrahydroxystilbene and 3,3',4,5'-tetrahydroxybibenzyl, the constituent of Cassia garrettiana on antigen-induced histamine release in vitro.** *Chemical & Pharmaceutical Bulletin*, v. 39(12): p. 3353-3354, 1991 (11 ref, Eng).

3,3',4,5'-Tetrahydroxystilbene (I) and 3,3',4,5'-tetrahydroxybibenzyl (II), isolated from the heartwood of *C. garrettiana*, showed inhibitory effects on antigen-induced histamine release from rat peritoneal mast cells in vitro. The inhibitory effect of I was much stronger than that of II. Compound II, as well as I also inhibited the histamine release from human peripheral basophils induced by anti-immunoglobulin E (IgE) in vitro, and its IC₅₀-value was 68.0 microM. These results suggest that the trans-olefin structure in the molecule may be necessary for I to have an inhibitory effect on histamine release. Considering that disodium cromoglycate did not show any significant inhibitory effect on anti-IgE-induced histamine release from human basophils, the strong inhibitory effects of I in both tests are of considerable interest.

9204-2232 Ishiguro, K., Fukumoto, H., Murashima, T., Kuriyama, M., Semma, M., Isoi, K.(Faculty of Pharmaceutical Sciences, Mukogawa Women's University, Koshien Kyuban-cho, Nishinomiya, Hyogo 663, Japan) **Antianaphylactic effects of the ethanolic extract from the petals of Impatiens balsamina L. in mice.**

Phytotherapy Research, v. 6(2): p. 112-113, 1992 (8 ref, Eng).

The antianaphylactic activity of 35 percent EtOH extract (IB) from the white petals of *I.balsamina* was investigated using murine immediate hypersensitivity reaction system induced by hen egg-white lysozyme (HEL). IB has a significant antianaphylactic activity.

9204-2233 Jain, S.C., Jain, R.(Medicinal Plants Research Laboratory, Department of Botany and Chemistry, University of Rajasthan, Jaipur 302004, India) **Medicinal efficacy of some arid zone plants.** *7th Asian Symposium on Med. Plants, Spices and Other Natural Prod.(ASOMPS VII). Manila, 2-7 February 1992* (Eng).

In order to shed light on some of the locally reported medicinal plants, *Asclepias curassavica*, *Calotropis procera*, *Cryptostegia grandiflora*, *Heliotropium* species, *Trigonella foenum-graecum*, *Nerium indicum*, *Tabernaemontana divaricata*, *Verbesina encelioides* and *Zingiber officinale* were studied in vivo and in vitro for their diverse biological and pharmacological properties. (Abstr. No. TP-23).

9204-2234 Jansakul, C., Mayakul, S., Intamano, S., Chanpromma, K. (Department of Biology and Chemistry, Faculty of Science, Prince of Songkla University, Haad-Yai, Thailand) **Vasodilator activities of N-butanol fraction from Melochia corchorifolia.** *7th Asian Symposium on Med. Plants, Spices, and Other Natural Products (ASOMPS VII). Manila, 2-7 February 1992* (Eng).

Pharmacological activities of n-butanol fraction from *M.corchorifolia* leaf was investigated. Studies were performed in vitro, using thoracic aorta, atrium, small intestine and uterus, obtained from female rats in estrus. The n-butanol fraction caused vasodilatation of the endothelium-intact thoracic aortic ring, preconstricted with noradrenaline, in a dose-dependent manner. Maximum vasodilatation was $85.9+8.8$ percent $\bar{x} \pm S.E.$, $n=4$ which was about the same as that obtained from acetylcholine. Some vasodilatation also occurred in the endothelium-denuded thoracic aortic ring when applying high doses of the fraction (0.06-0.2 g/ml). The results suggest that an active compound, present in the n-butanol fraction, may have a specific vasodilator activity on thoracic aorta with intact endothelium. (Abst.No. MP-11).

9204-2235 Kanzaki, T., Kimura, S.(Department of Dermatology, Nagoya City University Medical School, Mizuho-cho, Mizuho-ku, Nagoya 467, Japan) **Occupational allergic contact dermatitis from Perilla frutescens (schiso).** *Contact Dermatitis*, v. 26(1): p. 55-56, 1992 (4 ref, Eng).

Three cases of dermatitis from *P.frutescens* var.*acuta* and their treatment have been described.

9204-2236 Kasahara, Y., Kumaki, K., Katagiri, S.(The Yamagata Prefectural Institute of Public Health, 1-6-6 Tokamachi, Yamagata 990, Japan) **Pharmacological studies on flower petals of Carthamus tinctorius (II). Antiinflammatory effect.** *Shoyakugaku Zasshi*, v. 45(4): p. 306-315, 1991 (14 ref, Jap, Eng).

The preventive action of *C.tinctorius* on acute and chronic inflammations has been investigated. A *C.tinctorius* extract inhibited the hind-paw edema induced by various acute phagocytins (carrageenin, histamine, serotonin, bradykinin, prostaglandin E1) and the vascular permeability increase induced by acetic acid, indicating that it elicits the antiinflammatory activity at the exudative stage of inflammation. The *C.tinctorius* extract affected neither the proliferation of granulation tissue when tested by the cotton pellet method nor the development of adjuvant arthritis in rats, demonstrating that *C.tinctorius* extract might not be effective against the chronic inflammation. Furthermore, the *C.tinctorius* extract inhibited the carrageenin-induced hind-paw edema in sham-operated mice as well as in adrenalectomized mice, suggesting that the antiinflammatory action of the *C.tinctorius* extract might not be elicited via the adrenal glands.

9204-2237 Kim, N.J., Hong, N.D., Cho, C.K., Kim, J.S., Baek, S.H.* (East-West Medical Research Institute, Kyung Hee University, Seoul 130-702, Korea) **Studies on combined usage of combined preparation of crude drugs and anti-neoplastic drugs (1). Alleviative effect of combined usage of Gamisamryungbaekchool-San and cis-platin on the side actions of cis-platin.** *Korean Journal of Pharmacognosy*, v. 22(3): p. 197-206, 1991 (25 ref, Eng, Kor).

The water extract of Gamisamryungbaekchool-San (preparation of crude drugs namely Ginseng radix, Glycyrrhiza radix, Dolichoris semen, Amomi semen, Lonicerae flos, Taraxaci herba etc.) increased the lifespan of mice implanted intraperitoneally with sarcoma 180. Significant depression of lethal toxicity of cis-platin (45 micro M/kg, s.c.) and renal toxicity of cis-platin (35 microM/kg, s.c.) were observed in mice and rats treated with Gamisamryungbaekchool-San. RBC and WBC were significantly decreased in rats treated with cis-platin, and significant depression of hematologic toxicities of cis-platin (35 microM/kg, s.c.) in rats treated with Gamisamryungbaekchool-San.

9204-2238 Kim, T.H., Yang, K.S., Hwang, E.Z., Park, S.B.(College of Pharmacy, Sookmyung Women's University, Seoul, 140-742, Korea) **Effect of Ephedrae herba on**

the immune response in mice. *Korean Journal of Pharmacognosy*, v. 22(3): p. 183-191, 1991 (35 ref, Kor, Eng).

Group A and B of mice received i.p. injection of methanol extracts, ether fraction (E), petroleum ether fraction (PE), ethyl acetate fraction (EA) and water fraction (W) for 5 days or 10 days before sensitization. The other group received i.p. injection of ephedrine (Ep) or pseudoephedrine (Ep) for 1 day prior to sensitization. The change of body and spleen weights showed a tendency of decreasing but that of thymus showed increasing. Ear swelling was maximum at 40 hours after challenge and was significantly decreased in the groups treated with EA, W, Ep, and Ep.

9204-2239 Kinoshita, K., Morikawa, K., Fujita, M., Natori, S.*. (Meiji College of Pharmacy, Yato-cho, Tanashi-shi, Tokyo 188, Japan) Inhibitory effects of plant secondary metabolites on cytotoxic activity of polymorphonuclear leucocytes. *Planta Medica*, v. 58(2): p. 137-145, 1992 (27 ref, Eng).

The inhibitory effects of 151 natural products, representing most of the frequently occurring types, on the cytotoxicity to MM2 tumor cells of polymorphonuclear leucocytes (PMN) induced by TAK, a polysaccharide immunomodulator, were examined. Forty-two compounds inhibited the TAK-induced activation of PMN. Among them, some naturally occurring quinones and various alkaloids (nicotine, *Cinchona* alkaloids, isoquinoline alkaloids such as cepharnthine, and indole alkaloids such as ajmaline) exhibited potent inhibitory effects. Using the inhibition assay for monitoring, the extracts of *Hydrangea Dulcis folium*, *Scopoliae rhizoma*, *Cinchona cortex*, *Magnoliae cortex*, *Stephania tuber*, and *Rauwolfia radix* were analysed to characterize the active constituents.

9204-2240 Kitanaka, S., Takido, M. (College of Pharmacy, Nihon University, 7-7 Narashinodai, Funabashi-shi, Chiba 274, Japan) Studies on the constituents of the leaves of *Cassia torosa* Cav. II. The structure of two novel flavones, torosaflavone C and D. *Chemical & Pharmaceutical Bulletin*, v. 39(12): p. 3254-3257, 1991 (16 ref, Eng).

Two novel flavones, torosaflavone C(1) and D(2), were isolated from the leaves of *C. torosa*. The structures of 1 and 2 were established based upon spectral studies. Compound 1 displayed cytotoxic activity toward KB cells.

9204-2241 Kobayashi, M., Ueda, C., Aoki, S., Tajima, K., Tadnaka, N., Yamahara, J. (Kyoto Pharmaceutical University, Misasagi, Yamashina-ku, Kyoto 607, Japan) Anticholinergic action of paeony root and its active constituents. *Yakugaku Zasshi*, v. 110(12): p. 964-968, 1990 (11 ref, Eng).

Anticholinergic action of Paeony root was examined in in vivo experiments with rat in order to substantiate the presence of analgesic, antispasmodic and antidiarrhoeal properties. The 50 percent methanol extract of Paeony *Paeonia lactiflora* root was found to be effective. Fractionation of 50 percent methanol extract through column chromatography revealed that paeoniflorin was one of the active constituents in anticholinergic action in vivo, but in vitro, paeoniflorin had no effect on contractile responses of isolated rat proximal colon to the carbachol and KC1.

9204-2242 Kubo, I., Murai, Y., Soediro, I., Soetarno, S., Sastrodihardjo, S. (Division of Entomology and Parasitology College of Natural Resources, University of California, Berkeley, CA 94720, USA) Cytotoxic anthraquinones from *Rheum pulmatum*. *Phytochemistry*, v. 31(3): p. 1063-1065, 1992 (9 ref, Eng).

A new cytotoxic anthraquinone glucoside, pulmatin, 1,8-dihydroxy-3-methyl-anthraquinone-1-O-beta-D-glucoside, and its congeners, chrysophanein and physcionin, have been isolated as minor components from the root of *R. pulmatum*, an Indonesian Jamu (medicinal plant) known as 'kelembak' by recycling high performance liquid chromatography (R-HPLC). These anthraquinone glycosides exhibited moderate cytotoxic activity against several types of carcinoma cells. Their structures were established by means of spectroscopic methods, in particular, the NMR data.

9204-2243 Kulwant Singh, Singh, S.P. (Department of Zoology, DBS (PG) College, Dehra Dun 248001, UP, India) Effect of a herbal preparation on reproductive organs of female albino rats. *Himalayan Journal of Environment and Zoology*, v. 5(2): p. 82-86, 1991 (15 ref, Eng).

The effect of *Abrus precatorius*, *Daucus carota* and *Embelia ribes* seed powder on ovarian and uterine lusotarchitecture of female albino rats has been studied at doses of 50, 75, 100 mg/kg/day for 30 days. The doses 75 and 100 mg/kg/day showed a significant reduction in genital organ weight. There was no effect on body weight. Cellular organization of both ovary and uterus was affected leading to total degeneration. It appears that drugs may be useful for female contraception. NSL, New Delhi.

9204-2244 Lajis, N.H., Abdullah, A.S.H., Khan, M.N., Bremner, J.B. (Chemistry Department, Universiti Pertanian Malaysia 43400 UPM, Serdang, Selangor Darul Ehsan, Malaysia) Epi-Sarsasapogenin and epi-smilagenin: Two sapogenins isolated from the rumen content of sheep intoxicated by *Brachiaria decumbens*. 7th Asian Symposium on Med. Plants, Spices and Other Natural Prod. (ASOMPS VII). Manila, 2-7 February 1992 (Eng).

B. decumbens (Signal grass), an important source of fodder for ruminant production in Malaysia, has been confirmed to be hepatotoxic and nephrotoxic to sheep. The infusion of rumen liquor from *B. decumbens* intoxicated sheep into the rumen of cattle caused hepatic and renal dysfunction whereas the grass itself when fed directly to cattle did not produce toxic symptoms. The colourless material C₂₇H₄₄O₃, mp 190-193 degree C) isolated from the rumen content was shown to be a mixture of one major component (80 percent) and an isomeric minor component (20 percent) identified as epi-sarsasapogenin and epi-smilagenin respectively. The ¹H NMR spectrum of the compound isolated from rumen content is similar to that of epi-sarsasapogenin. (Abstr. No. TO-22).

9204-2245 Lajolo, F.M., Lanfer Marquez, U.M. , Filisetti-Cozzi, T.M.C.C., McGregor, D.I.(Departamento de Alimentos e Nutricao Experimental, Universidade de Sao Paulo-USP/FCF, Caixa Postal 66355, CEP 05389, Sao Paulo, SP, Brazil) **Chemical composition and toxic compounds in rapeseed (*Brassica napus L.*) cultivars grown in Brazil.** *Journal of Agricultural and Food Chemistry*, v. 39(11): p. 1933-1937, 1991 (36 ref, Eng).

The chemical composition, oil characteristics, and glucosinolate, sinapine, and phytic acid contents were studied on low glucosinolate *B. napus* varieties, experimentally grown in Brazil. Lipids (43-45 percent) with an erucic acid content lower than 1 percent and proteins (18-20 percent) were the main components. Dietary fiber in meals comprised 23.7-27.5 percent, when enzymatically determined. Mineral contents were high; dietary fiber and phytic acid can compromise their availability. Sinapine and esters were found at a mean content of 3.4 percent. Total aliphatic plus indolyl glucosinolates determined by GLC gave values between 26 and 43 micromol/g for air-dried, defatted seed meals, roughly similar to glucosinolate content determined by enzymatic release and colorimetric measurement of glucose (26-37 micromol/g).

9204-2246 Lam, Y.K., Sandrino-Meinz, M. , Huang, L., Busch, R.D., Mellin, T. , Zink, D., Han, G.Q.(Merck Sharp & Dohme Research Laboratories, Rahway, New Jersey 07065, USA) **5-O-Methyllicoricidin: A new and potent benzodiazepine-binding stimulator from *Glycyrrhiza uralensis*.** *Planta Medica*, v. 58(2): p. 221-222, 1992 (11 ref, Eng).

During screening for novel anxiolytics using a benzodiazepine (BDZ) binding assay, a dichloromethane extract of *G. uralensis* was found to stimulate the binding of BDZ to rat synaptosomes. The BDZ binding assay guided isolation, physico-chemical identification, and some biological data of this stimulator, 5-O-methyllicoricidin has been described.

9204-2247 Lamnaouer, D., Ben Khalti, F.(Department of Pharmacy and Toxicology, Institut Agronomique et Veterinaire Hassan II, BP 6202, Rabat, Morocco) **Anticoagulant activity of some components of *Ferula communis L.* in rats.** *7th Asian Symposium on Med. Plants, Spices and Other Natural Prod.(ASOMPS VII).* Manila, 2-7 February 1992 (3 ref, Eng).

Compounds were isolated from *F. communis* var. *genuina* by chromatography on silica gel column. Groups of rats were injected by different compounds and coagulation factors were determined by kit procedures. The anticoagulant effect was produced by the gum of *F. communis* as well as the 4-hydroxycoumarins isolated from the plant, but not by isoferprenine; a pyrane coumarin derivative. The structure-activity relationship is discussed. (Abstr. No. WP-19).

9204-2248 Lanher, M.C., Fleurentin, J. , Mortier, F., Vinche, A., Younos, C.(Laboratoire de Pharmacognosie, Centre des Sciences de l'Environnement, Universite de Metz, 1 rue des Recollets, F-57000 Metz, France) **Anti-inflammatory and analgesic effects of an aqueous extract of *Harpagophytum procumbens*.** *Planta Medica*, v. 58(2): p. 117-123, 1992 (16 ref, Eng).

The dried aqueous extract of *H. procumbens* exerted significant and dose-dependent anti-inflammatory and analgesic effects, from the dose 100 mg of dried secondary roots/kg, the first being obtained on an acute inflammatory process(carrageenan-induced edema test in rats) and the second being obtained against a chemical stimulus (writhing test in mice). Harpagoside does not appear to be involved in anti-inflammatory properties. Since this iridoid glycoside did not protect against carrageenan inflammatory effects when it was used at 5 and 10 mg/kg; 5 mg corresponding to the quantity contained in 400 mg of dried secondary roots. The main iridoid glycoside of *H. procumbens* appears to be implicated in the peripheral analgesic properties of this species, but other compounds have to be involved, since the dose of 10 mg/kg exerted a significant protective effect.

9204-2249 Leswara, N.D., Widjaja-Kusuma, R.(University of Indonesia, Faculty of Mathematics and Sciences, Pharmacy Department, Indonesia) **Correlation between aphrodisiac activity of *Eurycoma longifolia* samples to androgenic hormone (testosterone) contents in blood plasma as determined by radioimmunoassay method.** *7th Asian Symposium on Med. Plants, Spices, and Other Natural Prod.(ASOMPS VII).* Manilla, Philippine, 2-7 February 1992 (Eng).

Correlation between aphrodisiac activity to androgenic hormone (testosterone) content in blood plasma as determined by radioimmunoassay after oral administra-

tion of stem and root samples of Pasak bumi (*E.longifolia*) has been studied. Androgenic hormone assay in blood plasma was based on double antibody using autogamma scintillation counter and stated as the amount of bound hormone. It was observed that stem and root samples of Pasak bumi gave testosterone blood content 1.597 mg/ml and 1.733 mg/ml, which were higher than that in control. This observation proves that there is a correlation between androgenic activity to androgenic hormone content in blood plasma. (Abstr. No. MP-19).

9204-2250 Lim-Sylianco, C.Y., Serrame, E., Mallorca, R., Balboa, J., Sylianco-Wu, L. (Institute of Chemistry, University of the Philippines, Quezon City, Philippines) **Antigenotoxic activity of coconut oil in bone marrow cells of mice given azaserine, benzo(a)pyrene, dimethyl-nitrosamine, dimethylhydrazine, methylmethanesulfonate and tetracycline.** *7th Asian Symposium on Med. Plants, Spices and Other Natural Prod.(ASOMPS VII). Manila, 2-7 February 1992* (Eng).

Azaserine, benzo(a) pyrene, dimethylhydrazine, dimethylnitrosamine, methylmethanesulfonate and tetracycline are genotoxic to bone marrow cells of the experimental mice. When coconut oil was administered simultaneously with each genotoxin, there was reduction in the formation of micronucleated polychromatic erythrocytes, indicating the inhibition by coconut oil of the fragmentation of the chromatin material of bone marrow cells. When compared with soybean oil, coconut oil has a superior antigenotoxic activity. Dietary coconut oil gave similar effects. Of the triacylglycerols in coconut oil, trilaurin exhibited the highest antigenotoxic activity. (Abstr. No. TO-12).

9204-2251 Liu, Y.L., Ho, D.K., Cassady, J.M.* , Cook, V.M., Baird, W.M. (Division of Medicinal Chemistry and Pharmacognosy, College of Pharmacy, The Ohio State University, Columbus, Ohio 43210, USA) **Isolation of potential cancer chemopreventive agents from Eriodictyon californicum.** *Journal of Natural Products, v. 55(3): p. 357-363 , 1992* (13 ref, Eng).

Activity-based fractionation of twigs and leaf extract of *E.californicum* resulted in the isolation of 12 flavonoids that inhibit the metabolism of the carcinogen benzoapyrene by hamster embryo cells in tissue culture. One was identified as a new flavanone, 3'-methyl-4'-isobutyryleriodictyol, on the basis of spectroscopic analysis and alkaline hydrolysis. The seven other active flavanones were identified as eriodictyol, homoeriodictyol, 5,4'-di-hydroxy-6,7-dimethoxyflavanone, pinocembrin, sakuranetin, 5,7,4'-trihydroxy-6,3'-dimethoxyflavanone, and naringenin 4'methyl ether. Four active flavones were

also isolated: cirsimarinin, chrysoeriol, hispidulin, and chrysin. The high inhibition of benzoapyrene metabolism and the activation of benzoapyrene to ultimate carcinogenic DNA-binding metabolites by cirsimarinin and chrysoeriol at a concentration of only 10 microg/ml indicates that these flavones warrant further investigation in vivo as potential chemopreventive agents.

9204-2252 Lonergan, G., Routsi, E., Georgiadis, T., Agelis, G., Hondrelis, J. , Matsoukas, J.* , Larsen, L.K., Caplan, F.R. (Department of Chemistry, University of Patras, Patras, Greece) **Isolation, NMR studies, and biological activites of onopordopicrin from Centaurea sonchifolia.** *Journal of Natural Products, v. 55(2): p. 225-228 , 1992* (16 ref, Eng).

A sesquiterpene lactone, onopordopicrin, has been isolated from aerial parts of *C.sonchifolia*. Its structure was established by 2D NMR and the conformation in CHCl₃ was examined by nOe studies. Cytotoxic, antibacterial, and antifungal activities are reported.

9204-2253 Madulid, D.A., Cantoria, M.C. , Edrada, R.M. (Department of Botany, National Museum, P.Burgos, Manila, Philippines) **A pharmacognostical study of Philippine forest vines with biological activity: Study 1-Gynostemma pentaphyla.** *7th Asian Symposium on Med. Plants,Spices, and Other Natural Prod.(ASOMPS VII). Manila, Philippines, 2-7 February 1992* (2 ref, Eng).

The powdered plant materials, separately consisting of stems and leaves of *G.pentaphyla* were subjected to soxhlet extraction with methanol and the resulting methanolic extracts were concentrated in vacuo. Biochemical tests were done on both the extracts and these include protein stabilization test on egg albumin by thermal denaturation, erythrocyte hemolysis test, and platelet aggregation test, Brine shrimp bioassay was also done to determine the LC50 of the extracts. The total methanolic extract of the stem of *G.pentaphyla* inhibits protein denaturation as concentration of the extract increase. As compared with the methanolic extract of the leaves, optimum protein stabilization was obtained at 500 microg. Both the extracts inhibit platelet aggregation and erythrocyte hemolysis which indicates the occurrence of anti-inflammatory constituents. The methanolic extract of the stem shows greater inhibition of erythrocyte hemolysis as compared with the leaf extract. The extent of inhibition increases as concentration of the extract increases. The leaf extract displayed activity in the brine shrimp bioassay at 100 microg/mL and the stem extract at 152 microg/mL. (Abstr. No. MP-14).

9204-2254 Maligalig, D. (Wildlife Biology Laboratory, Institute of Biological Sciences, College of Arts and Sciences,

UP Los Banos, College, Laguna, Philippines) **Evaluation of the estrogenic properties of Curcuma longa and Artemisia vulgaris.** 7th Asian Symposium on Med. Plants, Spices, and Other Natural Prod. (ASOMPS VII). Manila, 2-7 February 1992 (3 ref, Eng).

Fertility regulating potential of *C.longa* was evaluated based on the estrogenic properties as shown by vaginal cornification and uterine weights on bilaterally ovariectomized rats. Estrogenicity of lyophilized *C.longa* 10.9, 13.8 and 17.8 g/kg doses was assayed on the estrous cycle, uterine weight and on some of the hematological parameters of castrated female albino rats. Vaginal cornification was observed in all treatment groups of the two extracts. At the end of the treatment period, 100 percent of rats treated with *C.longa* were in the estrus phase. Uterine weights in the two high doses of *C.longa* were higher than the normal but the lowest dose of 10.9 caused a decrease in weight of uteri. Hematological evaluation revealed an increase in RBC count, hematocrit and hemoglobin values corresponding to an increase in dose of *C.longa*. White blood corpuscle count of 10.9 g/kg was higher than the controls while the count was lowest at 13.8 g/kg of the *C.longa*. (Abstr. No. MP-20).

9204-2255 Manda, F., Tadera, K., Aoyama, K. (Department of Hygiene, Faculty of Medicine, Kagoshima University, 8-35-1 Sakuragaoka, Kagoshima 890, Japan) **Skin lesions due to okra (*Hibiscus esculentus* L.): Proteolytic activity and allergenicity of okra.** *Contact Dermatitis*, v. 26(2): p. 95-100, 1992 (14 ref, Eng).

Proteolytic activity was detected on the surface of immature okra pods and seemed to be sufficient to cause skin lesions. *In vivo*, intradermal injection of the enzyme solution prepared from immature okra pods increased capillary permeability in guinea pigs, in contrast to heated preparations. The fraction purified by preparative paper chromatography from an ethyl acetate extract of okra pods showed moderate allergenicity in the guinea pig maximization test.

9204-2256 Mandal, S., Sasmal, N.K. (Department of Parasitology, Faculty of Veterinary and Animal Sciences, Bidhan Chandra Krishi Vishwavidyalaya, Mohanpur, Nadia) **Histopathological study on the anticoccidial efficacy of a herbal product-1HP-250C against *E.tenella* infection in broiler chicks.** *Indian Journal of Indigenous Medicines*, v. 8(1): p. 9-19, 1991 (7 ref, Eng).

The efficacy of 1HP-250C, a herbal product, was evaluated histopathologically against *Eimeria tenella* infection of broiler chicks. The birds were treated with 0.3, 0.45 and 0.6 percent of the drug with feed since 1 day prior to 7 day post-infection. The drug at all dose levels showed

blunting and shortening of villi with hydropic/vacuolar degeneration by the invasion of parasites, as well as arrested development of all the endogenous stages from trophozoites to gamatocytes. The efficacy of the drug was directly proportional with the increase of dose levels. On 14 DPI after challenge with 25x1000 oocysts, there was nowhere any development of parasitic endogenous stage which indicated no interference of the drug with the development of immunity.

9204-2257 Mei, Q.B., Tao, J.Y., Cui, B. (Department of Pharmacology, The Fourth Military Medical University, Xian 710032, China) **Advances in the pharmacological studies of radix Angelica sinensis (Oliv) Diels (Chinese Danggui).** *Chinese Medical Journal*, v. 104(9): p. 776-781, 1991 (30 ref, Eng).

Chinese Danggui has been in use as a remedy for more than 2000 years. Review of work on this drug indicates that it can protect against myocardial injury, decrease vascular resistance and improve blood circulation, promote hematopoiesis, enhance immunity and possess analgesic and antinociceptive activity. In clinical practice, the drug or its constituent, besides its combined use with other medicinal herbs, was used singly in the treatment of cardiovascular diseases, such as uthromboangitis, ischemic apoplexy and chronic corpulmonale, and in the treatment of pain, such as dysmenorrhoea, headache and neurologia with satisfactory results.

9204-2258 Misra, S.K. (M/s Indian Herbs, Saharanpur, UP, India) **Effect of livol powder on broiler chicks with aflatoxin contaminated feed.** *Indian Journal of Indigenous Medicines*, v. 8(1): p. 77-84, 1991 (9 ref, Eng).

One hundred and forty eight day old healthy broiler chicks (Babcock BV-300) were procured and divided at random into two groups, A as experimental and, B, as control. All the groups were fed aflatoxin B1 (105 ppb) and B2 (17.5 ppb) contaminated feed from day 2 till day 42 (6 weeks). Group A chicks were administered LIVOL powder. The results indicated that the mortality rate was higher (15.5 percent) in control group B, than experimental group A (2.64 percent). The body weight gain was higher and mortality rate was lower in group A than the control group B. The growth rate was highly significant (P<0.05) in group A than the control group B, FCR value was wider in control group B and narrower in group A. The livability was significantly higher in group A (97.36 percent) than the control group B (84.50 percent). It was thus concluded that LIVOL powder has the capacity to counteract the damaging effects of aflatoxin in feed.

9204-2259 Misra, S.K. (M/s Indian Herbs, Saharanpur, UP, India) **Study on the efficacy of LIVOL liquid against**

aflatoxin B1 and B2 contaminated feed in broiler chicks. *Indian Journal of Indigenous Medicines*, v. 8(1): p. 55-67, 1991 (9 ref, Eng).

An experiment was conducted for a period of 42 days to study the efficacy of LIVOL liquid against aflatoxin B1 and B2 contaminated feed in broiler chicks. It was concluded that LIVOL liquid has the capacity to counteract the damaging effects of aflatoxin in feed and allows optimum body weight gain, FCR and livability in broiler chicks. Aflatoxin causes reduced growth rate and increases susceptibility of chicks to infectious disease by destroying immune system of the body. Livol liquid has better absorption and quicker action in overcoming the effects of aflatoxin.

9204-2260 Miyakoshi, M., Kasai, R., Nishioka, M., Ochiai, H., Tanaka, O.(Institute of Pharmaceutical Sciences, Hiroshima University School of Medicine, 1-2-3 Kasumi, Minami-Ku, Hiroshima, 734, Japan) **Solubilizing effect and inclusion reaction of cyclic bisdesmosides from tubers of *Bolbostemma paniculatum*.** *Yakugaku Zasshi*, v. 110(12): p. 943-949, 1990 (17 ref, Jap, Eng).

Tubeimosides I,II and III (cyclic bisdesmosides) were isolated from Chinese cucurbitaceous crude drug Tu-beimu, a tuber of *B.paniculatum*. Solubilizing effects of these cyclic bisdesmosides on water insoluble or less-soluble compounds were examined. Cyclic bisdesmosides were effective on increasing the solubility of Yellow OB, dl-alpha-tocopherol and saponin A from *Sapindus mukurossi*. The critical micell concentration (cmc) and association number as well as diameter of micell of tubeimoside I in water were also measured. The interaction of tubeimoside I with 1-anilino-8-naphthalene-sulfonate (ANS) in aqueous solution was investigated photometrically. Tubeimoside I strongly enhanced the intensity of fluorescence of ANS, suggesting the significant formation of inclusion complex.

9204-2261 Muller, B.M., Franz, G.(Faculty of Pharmacy, University of Regensburg, D(W)-8400 Regensburg, Federal Republic of Germany) **Chemical structure and biological activity of polysaccharides from *Hibiscus sabdariffa*.** *Planta Medica*, v. 58(1): p. 60-67, 1992 (32 ref, Eng).

Three water-soluble polysaccharides have been isolated from flower buds of *H.sabdariffa*. The neutral polysaccharides (HIB 1 and 2) are composed of arabinans and arabinogalactans of low relative molecular mass. The major fraction was investigated by methylation analysis, pectinase-treatment, mild acid hydrolysis, and NMR studies, and it was shown to be a pectin-like molecule. The main chain is composed of alpha-1,4-linked GalA (24 percent methyl-esterified) and alpha-1,2-linked Rha. Side chains are built of Gal and Ara and are connected to the main

chain via C-4 of every third Rha. Its structure seems to be different from polysaccharide structures described in other species of the *Hibiscus* genus and the Malvaceae family. All fractions were assayed for possible immune-modulating effects. All fractions showed some activity.

9204-2262 Mustafa, T., Srivastava, K.C.(University of Odense, Denmark) **Ginger (*Zingiber officinale*): A possible source of raw material for drug development for certain human diseases.** *Zingiberaceae Workshop, Prince of Songkla University, Hai Tai Thailand*, p. 16, 15-18 Oct. 1991 (Eng).

Principal targets for drug action on mammalian cells are (a) receptors(b) ionchannels (c) enzymes and (d) carrier models. The mode of action of ginger *Z.officinale* could be related to its effect on the enzymes (cyclo-oxygenase and lipoxygenase) involved in the synthesis of prostaglandins/eicosanoids whose levels are generally elevated in several diseases. Ginger consumption or the effect of ginger extract *in vitro* is known to modify the arachidonic acid metabolism which provides the contention of using ginger as the source of drug raw material. No side effects of ginger rhizome consumption have been documented and thus drugs prepared from it may be free from side effects. Possible efficacy of ginger in thrombosis and atherosclerosis, rhumatoid arthritis, migraine headache and dysmenorrhoea have been discussed.

9204-2263 Nabachandra Singh, Y., Bisht, M. , Pandey, D. (Reproductive Biology Lab; Department of Zoology Kumaun University Campus, Almora 263601, UP, India) **Effect of dry seed extract of a medicinal plant *Albizzia lebbek* on testicular and epididymal protein profiles of rats.** *Himalayan Journal of Environment and Zoology*, v. 5(2): p. 94-98, 1991 (15 ref, Eng).

Electrophoretic changes were observed on the protein profiles of seminiferous tubule fluid and epididymal fluid from caput and cauda regions after the administration of alcoholic extract prepared from the dry seeds of *A.lebbek* under non denaturing conditions. Significant effects of the alcoholic extracts were found on epididymal proteins and of aqueous extracts mainly on seminiferous tubule fluid, when compared with control ones. NSL, New Delhi.

9204-2264 Nahar, N., Nur-e-Alam, Nasreen, T. , Mosihuzzaman, M., Ali, L., Begum, R. , Khan, A.K.A.(Department of Chemistry, University of Dhaka, Dhaka 1000, Bangladesh) **Studies of blood glucose lowering effects of *Trigonella foenum-graecum* (Fenugreek) seeds.** *7th Asian Symposium on Med. Plants, Spices and Other Natural Prod.(ASOMPS VII)*. Manila, 2-7 February 1992 (Eng).

Blood glucose lowering effects of *T.foenum-graecum* was studied in normal and streptozocin-induced Long Evan rats. The whole seed powder, methanol extract, water extract and soluble dietary fibres had substantial acute blood glucose lowering effect. Toxicity studies of the whole seed powder was carried out on normal rats. The sample was non-toxic upto 10 g/kg body weight. Blood glucose lowering effects of the whole seed powder and soluble dietary fibre were also carried out on human subjects where similar hypoglycemic effect was found. Chemical composition of the whole seed powder and structural studies of the polysaccharide constituents of soluble dietary fibre have shown the presence of interesting carbohydrate polymers which may be singularly bioactive. (Abstr. No. TP-11).

9204-2265 Navaera, R.A.(Wildlife Biology Laboratory, Institute of Biological Sciences, University of the Philippines at Los Banos 4031, College, Laguna Philippines) **The Effect of kandi-kandilaan (*Stachytarpheta jamaicensis*) leaf extract on the first ten days of pregnancy in albino rats (*Rattus norvegicus*).** *7th Asian Symposium on Med. Plants, Spices and Other Natural Prod. (ASOMPS VII). Manila, 2-7 February 1992* (3 ref, Eng).

The effect of *S.jamaicensis* on the first ten days of pregnancy in albino rats was investigated using 0 percent, 15 percent and 30 concentrations with five replicates per treatment given orally. A significant decrease in RBC, WBC, hematocrit, number of pups, placenta and corpora lutea was observed in 30 percent treated rats. However, there was an increase in hemoglobin and WBC values. The 15 percent extract caused an increase in all hematological parameters (RBC, WBC, hematocrit and hemoglobin), but had no significant effect on the number of pups, placenta and corpora lutea. As there was no ova lost between ovulation and implantation in the control group, the 15 percent and 30 percent treated rats had an average of 0.5. Histological analysis showed congestion, necrosis and hemolytic spots in liver and lungs of extract-treated rats. Scars, mummified fetus were present in the placenta of the 30 percent-treated rats. The results indicate that *S.jamaicensis* leaf extracts at 15 and 30 percent levels, altered the normal reproductive and physiological activities of rats on the first ten days of pregnancy. (Abstr.No. MP-18).

9204-2266 Noamesi, B.K., Mensah, J.F., Dagne, E., Bogale, M (Department of Pharmacology, Faculty of Pharmacy, University of Science & Technology, Kumasi, Ghana) **Anti-ulcerative properties of some African medicinal plant extracts.** *7th Asian Symposium on Med. Plants, Spices and Other Natural Prod.(ASOMPS VII). Manila, 2-7 February 1992* (1 ref, Eng).

Pharmacological basis of the use of extracts of *Tavehiera abyssinica*, *Tetrapleura tetraptera* and *Guibour-*

ria ehie for gastrointestinal disorders especially stomach ulceration in ethnomedicine, has been studied. The results indicated that all the extracts possess significant antiulcer properties. A combination of both *T.tetraptera* and *G.ehie* is usually employed in Ghanaian ethnomedicine. The results however indicate that this combination has no significant advantage. (Abstr. No. WP-20).

9204-2267 Oda, Y., Tatsumi, Y., Aonuma, S.(Faculty of Pharmaceutical Sciences of Kinki University, Kowakae, Higashi-Osaka 557, Japan) **Mitogenic activity of *Tulipa gesneriana* lectins on mouse and human lymphocytes.** *Chemical & Pharmaceutical Bulletin, v. 39(12): p. 3350-3352, 1991* (10 ref, Eng).

T.gesneriana lectin-erythrocyte (TGL-E) which agglutinates mouse erythrocytes showed a potent mitogenic activity on mouse spleen cells and human peripheral blood lymphocytes, however, TGL-E had only slight mitogenic activity on mouse thymus cells. Its subunit alpha with a molecular weight (MW) of about 26000 showed a potent mitogenic activity as did that of native lectin, but subunit beta with a MW of about 14000 showed no activity, indicating that the mitogenic activity of TGL-E originates from subunit alpha. TGL-E stimulated T cell enriched spleen cells which passed through a nylon column, but not spleen cells from nude mouse or spleen cells treated with anti-Thy 1.2 antibody and complement. Thus, TLG-E stimulates only mouse T cells but not B cells. The other lectin in tulip bulbs, *T.gesneriana* lectin-yeast showed no mitogenic activity on mouse spleen, thymus cells or human peripheral blood lymphocytes.

9204-2268 Okuyama, E., Gao, L.H., Yamazaki, M.* (Faculty of Pharmaceutical Sciences, Chiba University, 1-33 Yayoi-cho, Chiba 260, Japan) **Studies on pharmacologically active principles from Indonesian crude drugs. III. Toxic components from *Brucea javanica* (L.) Merr..** *Yakugaku Zasshi, v. 110(11): p. 834-838, 1990* (5 ref, Eng).

During screening of pharmacologically active principles from Indonesian medicinal plants by a hypothermic effect the methanol- extract of *B.javanica* was found to exhibit a lethal toxicity to mice. The toxic components were isolated and identified with bruceoside A and B and yadan-zioside F.

9204-2269 Ozaki, Y., Ma, J.P., Hu, G.Q., Li, Y.K., Harada, M. (National Institute of Hygienic Sciences, 18-1, Kamiyoga 1-chome, Setagaya-ku, Tokyo 158, Japan) **Studies on mode of inhibitory effects of tetramethylpyrazine and ferulic acid on spontaneous movement of rat uterus in situ.** *Shoyakugaku Zasshi, v. 45(4): p. 299-305, 1991* (18 ref, Eng).

The mode of the inhibitory action of the tetramethylpyrazine, an alkaloid contained in *Ligusticum wallichii* and ferulic acid (phenolic compound of *L. wallichii* and *Angelica sinensis*) on spontaneous uterine contractions was studied in rats *in situ*. The inhibitory effect induced by tetramethylpyrazine was blocked by propranolol, but not by cimetidine, and the inhibitory effect was produced also in reserpinized rats. Tetramethylpyrazine slightly inhibited the 5-hydroxytryptamine or oxytocin-induced uterine contractions but scarcely the acetylcholine-induced contraction. The inhibitory effect induced by ferulic acid was blocked neither by propranolol nor by cimetidine. Ferulic acid inhibited the oxytocin-induced uterine contraction strongly, but not the acetylcholine- or 5-hydroxytryptamine-induced contraction. Indomethacin did not affect the inhibitory effects induced by tetramethylpyrazine and ferulic acid.

9204-2270 Pages, N., Fournier, G., Velut, V., Imbert, C. (Laboratoires de Toxicologie Faculte de Pharmacie, 5 Rue J.B. Clement, F-92296, Chatenay-Malabry Cedex, France) **Potential teratogenicity in mice of the essential oil of *Salvia lavandulifolia* Vahl. Study of a fraction rich in sabinyl acetate.** *Phytotherapy Research*, v. 6(6): p. 80-83, 1992 (31 ref, Eng).

A fraction of the essential oil of *S. lavandulifolia* containing 50 percent sabinyl acetate was used to evaluate its fetotoxic potential in mice. Pregnant dams were injected s.c. (15, 45 and 135 mg of this fraction/kg body weight) on days 6 to 15 of gestation. They were killed and subjected to uterine examination on day 17 of pregnancy. A significant maternal toxicity, as indicated by a reduced weight gain, was observed among pregnant dams receiving 45 or 135 mg/kg of the test material. In addition, a reduced hepatic weight was observed in the three treated groups in the females that had a reduced litter—thus indicating a greater susceptibility to sabinyl acetate during pregnancy—and in the 135 mg/kg treated group, in most of the dams. In the three treated groups the drug had a dose-dependant abortifacient effect, but was not fetotoxic. This work underlines the potential risk induced by the uncontrolled use of such essential oils in aromatherapy.

9204-2271 Panda, B.K. (Project Directorate on Poultry, Rajendranagar, Hyderabad, AP, India) **Effect of some indigenous drugs on experimentally induced carbon tetrachloride (CCl₄) toxicity in chicken.** *Indian Journal of Indigenous Medicines*, v. 8(1): p. 69-72, 1991 (6 ref, Eng).

The results of the experiment revealed improvements in clinical symptoms, regain of body weight, serum protein, cholesterol and other enzymes like acid and alkaline phosphatase. Glutamic Oxalo acetate, Transminase, GOT) and Glutamic Pyruvate Transminase (GPT), in LIVOL fed

group, indicating that LIVOL treatment helped in reducing the toxic effect of carbon tetrachloride by replacing the damaged hepatic cells due to carbon tetrachloride toxicity.

9204-2272 Panda, B.K. (Project Directorate on Poultry, Rajendranagar, Hyderabad, AP, India) **Effect of LIVOL treatment on experimentally induced aflatoxicosis in broilers.** *Indian Journal of Indigenous Medicines*, v. 8(1): p. 51-54, 1991 (8 ref, Eng).

Aflatoxin at the rate of 1.2 ppm was added in broiler ration of four groups (50 each in 25x2 replicates) from 4th weeks till 7th week of age. Two levels of LIVOL (0.50 percent and 0.25 percent) was used in two groups with one control each and a common control for all fed on starter feed. This experiment concluded that LIVOL treatment has some beneficial effect on hepatic damage caused by higher levels of aflatoxins in poultry feed.

9204-2273 Panda, B.K. (Project Directorate on Poultry, Rajendranagar, Hyderabad, AP, India) **Effect of LIVOL supplementation on growth and performance of pure line broilers.** *Indian Journal of Indigenous Medicines*, v. 8(1): p. 39-43, 1991 (9 ref, Eng).

Broiler chicks from day-old to six weeks of age were fed on broiler ration containing 0.75 percent, 0.5 percent, 0.25 percent LIVOL and one group served as 0 percent control. The weekly body weight in LIVOL fed groups was superior than control groups. The body weight gain and dressing weight were higher in 0.25 percent LIVOL fed birds than others. However, there was no difference in the weight of bursa, spleen and liver among groups. It was concluded that supplemented of 0.25 percent LIVOL in broiler ration ensures higher weight gain with better profit margin than birds reared without LIVOL.

9204-2274 Pandoleo, L., Chinellato, A., Froldi, G., Ragazzi, E., Caparrotta, L.* , Fassina, G. (University of Padua, Department of Pharmacology, Largo E. Meneghetti 2, 35100 Padova, Italy) **Studies on anti-inflammatory mechanism of action by resveratrol from *Polygonum* species.** *7th Asian Symposium on Med. Plants, Spices, and Other Natural Prod. (ASOMPS VII)*, Manila, 2-7 February 1992 (Eng).

The action of resveratrol on *in vitro* guinea-pig isolated trachea was investigated. The experiments were carried out on tracheal chains from normal and ovalbumin sensitized (2.5 mg/kg, 21-24 days before the experiment) animals. Resveratrol induced a concentration-dependent (1 micro M-0.1 micro M) relaxant effect which was only partially inhibited by 0.1 micro M nifedipine (a beta-blocker compound). 10 micro M mepacrine (an inhibitor of phospholipase A2) partially antagonized the relaxation by resveratrol. Pre-treatment with resveratrol (50M) was not

able to antagonize either histamine (10 micro M) or carbachol (0.1 micro M) induced contraction. Indomethacin (0.1 micro M) did not modify resveratrol effect. In sensitized tracheae, ovalbumin challenge (10 micro g/ml) induced a rapid contraction which reached a maximum in 2-5 minutes, thereafter decaying to the basal tone within 97+12 minutes. Pre-treatment with 100 micro M resveratrol reduced the duration of the recovery phase to (43+5) minutes. Mepacrine (10 micro M), and nordihydroguaiaretic acid (5 micro M), an inhibitor of lipoxygenase, slightly reduced the recovery phase if compared to resveratrol in ovalbumin-sensitized guinea-pig tracheae. It suggests that resveratrol is an inhibitor of arachidonic acid metabolism although an interaction with adrenergic mediator release at tracheal smooth muscle level cannot be excluded. (Abstr. No. MP-12B).

9204-2275 Panlilio, B., Aguinaldo, A., Yamauchi, T., Abe, F., Lim-Sylianco, C., Guevara, B. (College of Arts & Sciences, Angeles University Foundation, McArthur Highway, Angeles City, Philippines) **An antimutagenic constituents from *Ixora coccinea* Linn. (Rubiaceae).** *7th Asian Symposium on Med. Plants, Spices and Other Natural Prod. (ASOMPS VII)* Manila, 2-7 February 1992 (1 ref, Eng).

Antimutagenicity tests by the Rec-Assay and the Micronucleus Test revealed that the crude alcoholic extract and the ethyl acetate fraction of *I. coccinea* showed antigenic activity. Fractions obtained from the ethyl acetate extract were monitored using the Rec-Assay and were found to be antimutagenic against a known carcinogen, 4-nitroquinoline, in two *Bacillus subtilis* strains, H17-Rec and M45-Rec. Purification of an antimutagenic fraction gave a pale yellow powder as ursolic acid. The activity of the isolated compound was confirmed by the Rec-Assay. (Abstr. No. TP-15).

9204-2276 Paulino Lins, A., Maia Braggio, M., D'arc Felicio, J., Maria Giuriatti, A., Carlos Felicio, J. (Secao de Farmacologia, Instituto Biologico, Av. Cons. Rodriguez Alves, 1252, CEP 04014, Sao Paulo, SP, Brasil) **Chemical pharmacological aspects of *Guarea guidona*.** *Revista Latinoamericana de Quimica*, v. 22(4)+23(1): p. 30-33, 1992 (14 ref, Eng).

Three triterpenoids viz., 3-oxo-21,25-dihydroxy-21,23-epoxytirucall-7-en, meliandiol and an epimeric mixture of the melianone have been isolated from the seeds of *G. guidona*. Ethanolic extracts of the fruits exhibited a marked CNS depressant and analgesic activity.

9204-2277 Paulsen, E. (Dermato-Venerologisk afdeling I, Odense University Hospital, DK-5000 Odense C, Denmark) **Compositae dermatitis: a survey.** *Contact Dermatitis*, v. 26(2): p. 76-86, 1992 (51 ref, Eng).

Compositae dermatitis is an allergic contact dermatitis, frequently chronic, triggered by plants of the Compositae family. The condition, which is seen, in particular, in middle-aged and elderly persons, typically starts in the summer months with an acute eczema which disappears spontaneously during the fall of the year. The responsible allergens are sesquiterpene lactones. A survey is given of the possible modes of sensitization, sex and age distribution, the relationship to photosensitivity and atopy, as well as the possible treatment.

9204-2278 Peer, F., Sharma, M.C. (Division of Experimental Medicine and Surgery, Indian Veterinary Research Institute, Izatnagar 243122, India) **Efficacy of Liv 52 in experimental liver damage in goats.** *Journal of Research and Education in Indian Medicine*, v. 10(4): p. 11-16, 1991 (19 ref, Eng).

Efficacy of Liv 52 in CCl₄ induced hepatopathy was evaluated in goats, Liv 52 was given orally @ 1ml/kg body wt in two divided doses. Liv 52 treated animals showed significant clinical and haemato-biochemical changes than the controls..

9204-2279 Peralta, J.G., Zarzuelo, A., Busson, R., Cobbaert, C., de Witte, P. (Departamento de Farmacologia, Facultad de Farmacia, Granada, Spain) **(-)-Epicatechin-3-galloyl ester: a secretagogue compound from the bark of *Sclerocarya birrea*.** *Planta Medica*, v. 58(2): p. 174-175, 1992 (7 ref, Eng).

From the bark of *S. birrea* was isolated (-)-epicatechin-3-galloyl ester of which the structure was elucidated by NMR spectroscopy. The compound has secretagogue activity.

9204-2280 Pieretti, S., Di Giannuario, A., Capasso, A., Nicoletti, M. (Laboratorio di Farmacologia, Istituto Superiore di Sanita, Viale Regina Elena 299, 00161 Roma, Italy) **Pharmacological effects of phenylpropanoid glycosides from *Orobanche hederae*.** *Phytotherapy Research*, v. 6(2): p. 89-93, 1992 (27 ref, Eng).

A purified extract of *O. hederae* composed of two phenylpropanoid glycosides, verbascoside and orobanchoside (55:45), was investigated for its pharmacological profile. The extract did not exert significant changes on the nociceptive threshold in the hot plate test; no effect was registered on guinea-pig ileum. On the other hand, the phenylpropanoid glycoside mixture significantly prolonged sleep induced by pentobarbital and affected locomotor activity in mice; it also produced a slowing of the electroencephalographic trace and induced, when injected in the lateral cerebral ventricle, epileptiform activity in male

rabbits. These effects may suggest neuroleptic-like properties.

9204-2281 Pongprayoon, U., Baeckstrom, P., Jacobsson, U., Lindstrom, M., Bohlin, L.(Thailand Institute of Scientific and Technological Research, Bangkok 10900, Thailand) **Antispasmodic activity of beta-damascenone and E-phytol isolated from *Ipomoea pes-caprae*.** *Planta Medica*, v. 58(1): p. 19-21, 1992 (25 ref, Eng).

The crude extract (IPA) of the plant *I.pes-caprae* has previously been shown to antagonize smooth muscle contractions induced by several agonists via a non-specific mechanism. Bioassay-guided fractionation of IPA resulted in isolation of the antispasmodically acting isoprenoids beta-damascen-one and E-phytol. Their antispasmodic potencies were found to be in the same range as that of papaverine, a general spasmolytic agent. This effect was suggested to play a role in the previously observed anti-inflammatory activity of IPA by interfering with the contraction of endothelial cells. Severe vascular contraction has been shown to be involved in the dermatitis caused by toxic jellyfishes. It is possible that beta-damascenone and E-phytol, by interfering with the contraction of vascular smooth muscle cells, are partly responsible for the spasmolytic activity.

9204-2282 Pongprayoon, U., Bohlin, L., Baeckstrom, P., Jacobsson, U., Lindstrom, M.(Thailand Institute of Scientific and Technological Research, Bangkok 10900, Thailand) **Inhibition of ethyl phenylpropionate-induced rat ear oedema by compounds isolated from *Ipomoea pes-caprae* (L.) R.Br..** *Phytotherapy Research*, v. 6(2): p. 104-107, 1992 (11 ref, Eng).

The extract (IPA) of leaves from *I.pes-caprae* has previously been shown to reduce the development of rat ear oedema induced by ethyl phenylpropionate (EPP) in a dose-dependent manner. Using this bioassay to guide fractionation of the extract, two diastereomeric actinidols were isolated (0.8 percent of IPA). The actinidols constitute part of the active principle of IPA. Compounds, previously isolated from IPA, with either prostaglandin synthesis inhibiting activity in vitro {2-hydroxy-4,4,7-trimethyl-1(4H)-naphthalenone, (-)-mellein and eugenol} or antispasmodic activity (E-phytol) were also assayed for inhibitory effects on the development of EPP-induced rat ear oedema. They all reduced oedema formation dose-dependently. The results suggest that IPA consists of several active compounds which interfere with the process of inflammation in different ways.

9204-2283 Quetin-Leclercq, J., De Pauw-Gillet, M.CI., Angenot, L., Bassleer, R.(Laboratory of Pharmacognosy, Pharmaceutical Institute, University of Liege, Rue Fusch 5,

B-4000 Liege, Belgium) **Effect of strychnopentamine on cells cultured in vitro.** *Chemico-Biological Interactions*, v. 80(2): p. 203-216, 1991 (15 ref, Eng).

Strychnopentamine, a dimeric indole alkaloid extracted from the leaves and stem bark of *Strychnos usambarensis*, exerted a powerful cytotoxic action on B16 melanoma cells and non-cancer human fibroblasts cultured in vitro. IARI, New Delhi.

9204-2284 Qureshi, S., Shah, A.H.* , Ageel, A.M.(Central Laboratory for Drug and Food Analysis, MOH, PO Box 59082, Riyadh-11525, Saudi Arabia) **Toxicity studies on *Alpinia galanga* and *Curcuma longa*.** *Planta Medica*, v. 58(2): p. 124-127, 1992 (35 ref, Eng).

Acute (24h) and chronic (90 days) oral toxicity studies on the ethanolic extracts of the rhizomes of *A.galanga* and *C.longa* were carried out in mice. Acute dosages were 0.5, 1.0 and 3 g/kg body weight while the chronic dosage was 100 mg/kg/day as the extract. During this investigation no significant mortality as compared to the controls was observed. The weight gain in the *A.galanga* treated animals was significant as in the control group while the *C.longa*-treated animals gained no significant weight after chronic treatment. *C.longa* treatment induced significant changes in heart and lungs weights upon chronic treatment. Hematological studies revealed a significant rise in the RBC level of *A.galanga*-treated animals and a significant fall in the WBC and RBC levels of the *C.longa*-treated animals as compared to the controls. The gain in weights of sexual organs and increased sperm motility and sperm counts were observed in both group of extract-treated male mice, however, these changes were highly significant in the *A.galanga*-treated group. Both extracts failed to show any spermatotoxic effects.

9204-2285 Rafatullah, S., Mossa, J.S., Ageel, A.M., Al-Yahya, M.A. , Tariq, M.* (Medicinal, Aromatic and Poisonous Plants Research Center and Department of Pharmacognosy and Pharmacology, College of Pharmacy, King Saud University, PO Box 2457, Riyadh-11451, Saudi Arabia) **Hepatoprotective and safety evaluation studies on sarsaparilla.** *International Journal of Pharmacognosy*, v. 29(4): 296-301, 1991 (35 ref, Eng).

The effect of the ethanol extract of sarsaparilla (*Smilax regelii*) on carbon tetrachloride (CCl₄)-induced hepatocellular damage in rats has been reported. Pretreatment with an ethanol extract of sarsaparilla significantly inhibited CCl₄-induced biochemical changes. Acute and chronic toxicity studies were also undertaken to determine the safety of prolonged use of sarsaparilla. Acute administration of sarsaparilla extract in the dose range of 0.5 to 3.0 g/kg did not produce any adverse effects or mortality

in mice over a period of 24 hours. Animals treated with sarsaparilla extract (100 mg/kg/day) for a period of 90 days in drinking water showed no symptoms of toxicity. There was no significant change in body weight and hematological parameters in the chronically treated animals as compared to the control group. These findings suggest that sarsaparilla, besides having hepatoprotective potential, has no untoward effects in rodents.

9204-2286 Rana, A.C., Avadhoot, Y.* (Department of Pharmaceutical Sciences, Dr HS Gour University, Sagar 470003, MP, India) **Experimental evaluation of hepatoprotective activity of *Gymnema sylvestre* and *Curcuma zedoaria*.** *Fitoterapia*, v. 63(1): p. 60-62, 1992 (12 ref, Eng).

Alcoholic extracts of the leaves of *G.sylvestre* and nodular roots of *C.zedoaria* were obtained by cold maceration. The hepatoprotective action of a dose of 300 mg/kg of both the extracts was studied against CCl₄ induced damage. The extracts were found to be effective in preventing damage which was evident by morphological, biochemical and functional parameters.

9204-2287 Reyes, A.G., Lim-Sylianco, C.L. , Gercayo, A.M. (Department of Biochemistry and Molecular Biology, College of Medicine , UP, Manila, Philippines) **Antigenotoxicity potential of *Quisqualis indica* and *Allium sativum* L. against somatic cell genotoxicity.** *7th Asian Symposium on Med. Plants, Spices, and Other Natural Prod. (ASOMPS VII). Manila*, 2-7 February 1992 (Eng).

Mutagenicity and antimutagenicity tests were performed for different extracts of *Q.indica* (niyog-nyiog) and *A.sativum* (bawang). Results showed that extracts of niyog-nyiog nuts and bawang are not mutagenic but exhibit antigenotoxic properties in *in vivo* and *in vitro* assays. The polar extracts of niyog-nyiog and bawang were found to be non-mutagenic in the Rec assay and reduced the direct DNA-damaging effects of known chemical mutagens. This suggests that bawang and niyog-nyiog possess anti-mutagenic properties. (Abstr.NO. TP-25).

9204-2288 Santiago, L.A., Osato, J.A.* , Hiramatsu, M., Mori, A. (Department of Neurochemistry, Institute for Neurobiology, Okayama University Medical School, 2-5-1 Shikata-Cho, Okayama, 700, Japan) **Antioxidant action of bio-catalyzer alpha.rho No. 11 (Bio-normalizer).** *7th Asian Symposium on Med. Plants, Spices and Other Natural Prod.(ASOMPS VII). Manila, Philippines*, 2-7 February 1992 (Eng).

Bio-catalyzer alpha.rho No. 11 (Bio-normalizer)- a commercially available natural, sweet, granular, health product of Sun-O International Inc, Gifu, Japan- is made by

fermentation of Philippine medicinal plants such as *Carica papaya*, *Pennisetum purpureum* and *Sechium edule* yeast and glucose. Its antioxidant action was examined by electron spin resonance spectrometry using a spin trap 5,5-dimethyl-1-pyrroline-N-oxide. Bio-catalyzer scavenged 95 percent of the hydroxyl radical, 1,1-diphenyl-2-picryl-hydrazyl radical. Oral administration of 1 g/kg body weight of Bio-catalyzer significantly inhibited thiobarbituric acid reactive substances level, an index of lipid peroxidation, in the iron-induced epileptic foci of rats. These findings suggest that Bio-catalyzer may be a useful health food against neuronal lipid peroxidation, post-traumatic epilepsy and aging. (Abstr. No. MP-16).

9204-2289 Sapra, K.L., Shingari, B.K.(Department of Animal Science, Punjab Agricultural University, Ludhiana, Punjab, India) **Effect of feeding LIVOL on growth in Turkeys.** *Indian Journal of Indigenous Medicines*, v. 8(1): p. 95-98, 1991 (7 ref, Eng).

Thirty six, one week-old turkey poult in two groups were fed either control diet or control diet with LIVOL added for a period of 40 weeks. The LIVOL feeding improved the body weight gains significantly (11.29 percent) and FCR 4.40 percent over the control birds. The carcass yield also improved by 1 percent in LIVOL fed birds in both sexes. It is concluded that LIVOL feeding in growing turkey pults improves the weight gains and FCR significantly and may thus be economical.

9204-2290 Sapra, K.L., Shingari, B.K.(Department of Animal Science, Punjab Agricultural University, Ludhiana, Punjab, India) **Effects of feeding LIVOL on egg production in quail hens.** *Indian Journal of Indigenous Medicines*, v. 8(1): p. 85-89, 1991 (6 ref, Eng).

LIVOL was fed to the quail hens in the manufacturer recommended doses. The HDEP was observed to be 44.35 and 48.76 percent in control and LIVOL fed groups respectively indicating a statistically highly significant improvement in egg production in LIVOL fed birds. The differences in egg weight were, however, insignificant. The improvement in efficiency of feed utilization per dozen produced in LIVOL fed group was observed to be 26.30 percent over control. A similar trend was observed in the improvement of feed utilization per kg of egg mass laid. The LIVOL fed group indicated an improvement by 12.21 percent over control group. It is, therefore, concluded that feeding of LIVOL may be economical through better egg production and feed utilization in quail hens.

9204-2291 Sato, Y., Ohta, S., Shinoda, M.* (Faculty of Pharmaceutical Sciences, Hoshi University, 2-4-41, Ebara, Shinagawa-ku, Tokyo, 142, Japan) **Studies on chemical protectors against radiation. XXXI. Protection effects of**

Aloe arborescens on skin injury induced by X-irradiation. *Yakugaku Zasshi*, v. 110(11): p. 876-884, 1990 (33 ref, Eng, Jap).

Protective effects of *A.arborescens* (AA) on mouse skin injury induced by soft X-irradiation were examined. The mechanisms on radiation protection by measuring scavenging activity of activated oxygen, protective effects of nucleic acid, induction of antioxidative protein and so on were further investigated. Consequently a significant protective effect of skin injury was observed in AA S6-3-b. AA S6-3-b showed scavenging activity of hydroxyl radicals generated by Haber-Weiss reaction. AA S6-3-b suppressed the changes of activity in superoxide dismutase and glutathione peroxidase at 7d after soft X-irradiation. Metallothionein was induced in the skin and liver against normal mice at 24h after administration of AA S6-3b.

9204-2292 Saukhla, A., Mathur, P.N., Saukhla, A.K., Dashora, P.K. (Rajasthan Agricultural University, Bikaner Campus, Udaipur, Rajasthan, India) **Comparative efficiency of Shilajeet and gum guggal (*Commiphora mukul*) in preventing diet induced hypercholesterolemia in Wistar rats.** *Indian Journal of Clinical Biochemistry*, v. 7(1): p. 45-48, 1992 (19 ref, Eng).

Shilajeet a polycrest Ayurvedic drug hitherto unknown for its hypolipidemic effect has been shown to lower serum cholesterol, liver cholesterol, serum triglycerides, and serum phospholipids, of Wister rats fed on a cholesterol 1 percent supplemented diet, by 39,55,47 and 25 percent respectively. When 0.2 percent of it was incorporated in the diet. In comparison, gum guggul (2.0 percent in the diet) lower the serum cholesterol, liver cholesterol, serum triglycerides and serum phospholipids by 36,60,49 and 8 percent respectively. The increase in HDL-cholesterol by Shilajeet was much higher (53 percent) compared to that by gum guggul.

9204-2293 Sendl, A., Elbl, G., Steinke, B., Redl, K., Breu, W., Wagner, H. (Institute of Pharmaceutical Biology, University of Munich, Karlstr. 29, D(W)-8000 Munchen 2, Federal Republic of Germany) **Comparative pharmacological investigations of Allium ursinum and Allium sativum.** *Planta Medica*, v. 58(1): p. 1-7, 1992 (39 ref, Eng).

Extracts of wild garlic (*A.ursinum*) and garlic (*A.sativum*) were investigated for their in vitro inhibitory potential on 5-lipoxygenase (LO), cyclooxygenase (CO), thrombocyte aggregation (TA) and angiotensin I-converting enzyme (ACE). The inhibition rates as IC₅₀ values of both extracts for 5-LO, CO, and TA showed a good correlation with the percent content of the major S-containing compounds (thiosulfinate and ajoenes) of the various ex-

tracts. In the 5-LO and CO test the garlic extracts are slightly superior to the wild garlic extracts whereas, in the TA test, no differences could be found. In the ACE test the water extract of the leaves of wild garlic containing glutamylpeptides showed the highest inhibitory activity followed by that of the garlic leaf and the bulbs of both drugs. The comparative studies underline the usefulness of wild garlic as a substitute of garlic.

9204-2294 Sertie, J.A.A., Basile, A.C., Oshiro, T.T., Silva, F.D., Mazella, A.A.G. (Departamento de Farmacologia, Instituto de Ciencias Biomedicas, Universidade de Sao Paulo, USP, 05508, Sao Paulo, S.P., Brazil) **Preventive anti-ulcer activity of the rhizome extract of Zingiber officinale.** *Fitoterapia*, v. 63(1): p. 55-59, 1992 (16 ref, Eng).

The acetone and ethanol dry extracts of fresh rhizome of *Z.officinale* given orally inhibited gastric secretion in the pylorus-ligated rats. At dose of 62.01 mg/kg (ED₅₀) the acetone extract was more effective than the ethanol extract and cimetidine in reducing gastric volume. Stress-induced lesions were significantly prevented by both extracts, but the acetone appeared more effective than the ethanol extract, less effective than cimetidine and equivalent to misoprostol.

9204-2295 Sharma, H.M., Dwivedi, C., Salter, B.C., Abou-Issa, H. (College of Medicine, The Ohio State University Columbus, Ohio-43210, USA) **Antineoplastic properties of Maharishi Amrit Kalash, an Ayurvedic food supplement, against 7,12-dimethylbenz (a)anthracene-induced mammary tumors in rats.** *Journal of Research and Education in Indian Medicine*, v. 10(3): p. 1-8, 1991 (14 ref, Eng).

Maharishi Amrit Kalash (MAK) an Ayurvedic food supplement, constitutes *Curculigo orchioides*, *Gymnema currentiacum*, *Sphaeranthus indicus*, *Vanda spatulatum*, *Glycyrrhiza glabra* and Butterfly pea Elephant creeper, Indian wild pepper. MAK did not influence food intake, but protected against dimethylbenz anthracene induced tumors in rats..

9204-2296 Shimizu, N., Asahara, H., Tomoda, M.*., Gonda, R., Ohara, N. (Kyoritsu College of Pharmacy, Shibakoen, Minato-ku, Tokyo 105, Japan) **Constituents of the seed of Malva verticillata. VII. Structural features and reticuloendothelial system-potentiating activity of MVS-I, the major neutral polysaccharide.** *Chemical & Pharmaceutical Bulletin*, v. 39(10): p. 2630-2632, 1991 (19 ref, Eng).

The structural features of MVS-I, the major neutral polysaccharide isolated from the seeds of *M.verticillata*

were elucidated by controlled Smith degradation, methylation analysis, partial acid hydrolysis and enzymic degradation studies. It has a backbone chain composed of beta-1,3-linked D-glucose and D-galactose residues having branches composed of alpha-1,5-linked L-arabinosyl beta-1,4-linked D-galactose and of beta-1,4-linked D-galactosyl beta-1,3-linked D-glucose residues at position 6 of a part of D-galactose units as side chains. MVS-I showed remarkable reticuloendothelial system-potentiating activity in a carbon clearance test.

9204-2297 Shimizu, N., Tomoda, M.* , Kanari, M. , Gonda, R. (Kyoritsu College of Pharmacy, Shibakoen, Minato-ku, Tokyo 105, Japan) **An acidic polysaccharide having activity on the reticuloendothelial system from the root of *Astragalus mongholicus*.** *Chemical & Pharmaceutical Bulletin*, v. 39(11): p. 2969-2972, 1991 (41 ref, Eng).

An acidic polysaccharide, designated as A Mon-S, was isolated from the roots of *A.mongholicus*. It was homogeneous on electrophoresis and gel chromatography, and its molecular mass was estimated to be 7.6×10000 . It showed significant reticuloendothelial system-potentiating activity in a carbon clearance test. It is composed of L-arabinose: D-galactose: D-galacturonic acid: D-glucuronic acid in the molar ratio of 18:18:1:1, in addition to small amounts of O-acetyl groups and peptide moiety. A part of the hexuronic acid residues exist as the methyl esters. Methylation analysis, carbon-13 nuclear magnetic resonance and periodate oxidation studies enabled elucidation of its structural features and revealed mainly alpha-arabino-beta-3,6-galactan type structural units.

9204-2298 Shukla, B., Visen, P.K.S., Patnaik, G.K., Tripathi, S.C. , Srimal, R.C., Dayal, R., Dobhal, P.C.(Division of Pharmacology, Central Drug Research Institute, Lucknow 226001, India) **Hepatoprotective activity in the rat of ursolic acid isolated from *Eucalyptus hybrid*.** *Phytotherapy Research*, v. 6(2): p. 74-79, 1992 (26 ref, Eng).

Ursolic acid has been evaluated for its choleric, anticholestatic and hepatoprotective activities in rats. It produced a dose-dependent (5-20 mg/kg) choleric effect. Significant anticholestatic activity (27.9-100 percent) was observed against paracetamol (2.0g/kg) induced cholestasis. The compound also showed a marked hepatoprotective activity against paracetamol and galactosamine (800 mg/kg) induced hepatotoxicity by reversing the altered values in viability of the isolated hepatocytes and the altered biochemical liver and serum parameters. The activity of ursolic acid compared well with the known hepatoprotective drug, silymarin.

9204-2299 Shukla, B., Visen, P.K.S., Patnaik, G.K., Dhawan, B.N.* (ICMR Centre for Advanced Pharmacological Research on Traditional Remedies, Central Drug Research Institute, Lucknow-226001, UP, India) **Choleretic effect of andrographolide in rats and guinea pigs.** *Planta Medica*, v. 58(2): p. 146-149, 1992 (18 ref, Eng).

Andrographoide from the herb *Andrographis paniculata*(whole plant) per se produces a significant dose (1.5-12 mg/kg) dependent choleretic effect (4.8-73 percent) as evidenced by increase in bile flow, bile salt, and bile acids in conscious rats and anaesthetized guinea pigs. The paracetamol induced decrease in volume and contents of bile was prevented significantly by andrographolide pretreatment. It was found to be more potent than silymarin, a clinically used hepatoprotective agent.

9204-2300 Singh, R.P., Singh, R.G., Pandey, B.L., Usha, Shukla, K.P., Udupa, K.N.(Department of Nephrology, Institute of Medical Sciences, BHU, Varanasi 221005, India) **Experimental evaluation of diuretic action of herbal drug Trinapanchamula.** *Journal of Research and Education in Indian Medicine*, v. 10(4): p. 35-39, 1991 (15 ref, Eng).

Herbal compound formulation Trinapanchamula comprised of *Saccharum officinale*, *S.munja*, *S.spontaneum*, *Desmostachya bipinnata* and *Cynodon dactylon* was evaluated in rats. The biochemical changes indicate the potent nature of the diuretic formulation..

9204-2301 Singh, S., Agrawal, S.S.(Department of Pharmacology, College of Pharmacy, Pushp Vihar, New Delhi 110017, New Delhi) **Anti-asthmatic and anti-inflammatory activity of *Ocimum sanctum*.** *International Journal of Pharmacognosy*, v. 29(4): p. 306-310, 1991 (9 ref, Eng).

The anti-asthmatic activity of a 50 percent aqueous ethanol extract of dried and fresh leaves, and the volatile and fixed oils of *O.sanctum* was evaluated against histamine and acetylcholine-induced pre-convulsive dyspnea (PCD) in guinea pigs. The 50 percent ethanol extract of fresh leaves, volatile oil extracted from fresh leaves and fixed oil from the seeds significantly protected the guinea pigs against histamine-and acetylcholine-induced PCD. These extracts also inhibited hind paw edema induced in rats by treatment with carrageenan, serotonin, histamine or PGE2. However, the 50 percent ethanol extract of dried leaves did not protect the guinea pigs against histamine-induced PCD.

9204-2302 Storie, G.J., McKenzie, R.A. , Fraser, I.R.(Queensland Department of Primary Industries, Animal Research Institute, Yeerongpilly, Queensland 4105,

Australia) Suspected packalacca (*Phytolacca dioica*) poisoning of cattle and chickens. *Australian Veterinary Journal*, v. 69(1): p. 21-22, 1992 (8 ref, Eng).

Two incidents of poisoning, one in 6 dairy cattle and second in 30 adult fowls, are reported. Both these groups consumed large quantities of seeds of *P.dioica* and the results were fatal. Symptoms of poisoning are described.

9204-2303 Surender Singh, Agrawal, S.S.(Department of Pharmacology, College of Pharmacy, New Delhi 110017, India) **Antiasthmatic and anti-inflammatory activity of *Ocimum sanctum* Linn.. *Journal of Research and Education in Indian Medicine*, v. 10(3): p. 23-28, 1991 (9 ref, Eng).**

Antiasthmatic activity of ethanol extract (50 percent) of fresh and dried leaves, volatile and fixed oils of *O.sanctum* was evaluated against induced preconvulsive dyspnoea (PCD) in guinea pigs. The 50 percent extract of fresh leaves, volatile oil from fresh leaves and fixed oil from seeds, significantly protected guinea pigs against induced PCD. These extracts also inhibited hind paw oedema in rats. However, 50 percent ethanol extract of dried leaves did not protect the animals against PCD.

9204-2304 Suzuki, M., Nikaido, T., Ohmoto, T.* (Toho University, School of Pharmaceutical Sciences, Funabashi, Chiba 274, Japan) **The study of Chinese herbal medicinal prescription with enzyme inhibitory activity. V. The study of Hange-shashin-to, Kanzo-shashin-to, Shokyo-shashin-to with adenosine 3',5'-cyclic monophosphate phosphodiesterase. *Yakugaku Zasshi*, v. 111(11): p. 695-701, 1991 (8 ref, Eng).**

Fifty-nine species of extracts of Chinese herbal medicinal prescription were tested for inhibitory activity of adenosine 3',5'-cyclic monophosphate (cAMP) phosphodiesterase (PDE). Kanzo-shashin-to showed the highest activity in these prescriptions. Kanzo-shashin-to, Hange-shashin-to and Shokyo-shashin-to, whose constricting crude drugs were very similar, were especially studied among these prescriptions. *Pinellia* tuber acted as an ascent component for *Scutellaria* root and a mitigatory component for *Glycyrrhiza*. *Jujube* acted as a mitigatory component for *Glycyrrhiza*. *Ginger* acted as an additional component for *Scutellaria* root in cAMP PDE test. This additional effect of 6-gingerol, 6-shogaol from ginger and baicalin from *Scutellaria* root were investigated.

9204-2305 Takechi, M., Shimada, S., Tanaka, Y.(Faculty of Pharmaceutical Sciences, Kinki University, Higashiosaka 577, Japan) **Time course and inhibition of saponin-induced hemolysis. *Planta Medica*, v. 58(2): p. 128-130, 1992 (7 ref, Eng).**

Hemolytic activities of 3 steroid saponins reached plateaus within 5 min, whereas those of 4 triterpenoid saponins did not within 60 min. Erythrocytes pretreated with a low concentration of tigogenin were resistant to hemolysis of some of these saponins, but those pretreated with hecogenin or tomatidine were as sensitive as non-treated erythrocytes. Therefore, the ketone group of hecogenin or the amino group of tomatidine would weaken the interactions between the erythrocytes and these sapogenins. Furthermore, incubations of these saponins with a small amount of cholesterol diminished the hemolytic activities.

9204-2306 Terashima, S., Shimizu, M.*, Horie, S., Morita, N. (Faculty of Pharmaceutical Sciences, Toyama Medical and Pharmaceutical University, 2630 Sugitani, Toyama 930-01, Japan) **Studies on aldose reductase inhibitors from natural products. IV. Constituents and aldose reductase inhibitory effect of *Chrysanthemum morifolium*, *Bixa orellana* and *Ipomoea batatas*. *Chemical & Pharmaceutical Bulletin*, v. 39(12): p. 3346-3347, 1991 (20 ref, Eng).**

The hot water extracts of *C.morifolium*, *B. orellana*, *I.batatas* were found to have potent inhibitory activity towards rat lens aldose reductase (AR). Ellagic acid was isolated from *C.morifolium* and *I.batatas*, isoscutellarein from *B.orellana* and 3,5-dicaffeoylquinic acid from *I.batatas*, respectively, as potent inhibitors.

9204-2307 Thomas, G., Melo Diniz, M.de F.F. , Mukherjee, R. (Laboratorio de Technologia Farmaceutica, Universidade Federal da Paraiba, Caixa Postal 5009, 58059-Joao Pessoa, Paraiba, Brazil) **Further studies on the antidiarrhoeal activity of bisnordihydrotoxiferine, a tertiary indole alkaloid in rodents. *Phytotherapy Research*, v. 6(2): p. 84-88, 1992 (19 ref, Eng).**

The dimeric tertiary indole alkaloid bisnordihydrotoxiferine isolated from the root bark of *Strychnos trinervis* inhibited, on i.p. administration, *Escherichia coli* induced diarrhoea and cholera toxin-stimulated intestinal fluid accumulation in mice. The respective ED50 values were 10.6 and 20.0 mg/kg. Bisnor was inactive against PGE2-induced contractions in the ileum. The mechanism of action of the alkaloid may be related to nonspecific antagonism of gastrointestinal smooth muscle stimulant activity of several endogenous substances.

9204-2308 Tripathi, C.D., Biswas, A.R. , Pradhan, S.C., Bapna, J.S., Srivastava, Y.P.(Department of Pharmacology, Jawaharlal Institute of Postgraduate Medical Education and Research, Pondicherry 605006, India) **Neuropsychopharmacological studies on the leaves of *Rhododendron arboreum*. *Fitoterapia*, v. 63(1): p. 63-66, 1992 (14 ref, Eng).**

The water extract of *R. arborum* leaves was studied for CNS activities like general behaviour, pentobarbitone hypnosis, rota-rod performance and amphetamine induced group excitement in albino rats and mice. Less than one tenth of the LD50 dose (320+-18.87 mg/kg) showed a CNS depressant activity.

9204-2309 Tsuruga, T., Ebizuka, Y., Nakajima, J., Chun, Y.T., Noguchi, H., Iitaka, Y., Sankawa, U. (Faculty of Pharmaceutical Sciences, The University of Tokyo, 7-3-1, Hongo, Bunkyo-ku, Tokyo 113, Japan) **Biologically active constituents of *Magnolia salicifolia*: Inhibitors of induced histamine release from rat mast cells.** *Chemical & Pharmaceutical Bulletin*, v. 39(12): p. 3265-3271, 1991 (16 ref, Eng).

The extracts of the flower buds of *M. salicifolia* showed remarkable anti-allergy effects in passive cutaneous anaphylaxis test. The bioactive constituents of this medicinal drug were isolated by monitoring their activities with an in vitro bioassay system measuring inhibitory effects on induced histamine release from rat mast cells. Of the ten isolated compounds magnosalicin is a new compound of neolignan structure. In addition to the isolated compounds samples of coumarins and lignans were evaluated for their biological activities with the vitro bioassay.

9204-2310 Tsuruga, T., Chun, Y.T., Ebizuka, Y., Sankawa, U.* (Faculty of Pharmaceutical Sciences, The University of Tokyo, 7-3-1, Hongo, Bunkyo-ku, Tokyo 113, Japan) **Biologically active constituents of *Melaleuca leucadendron*: Inhibitors of induced histamine release from rat mast cells.** *Chemical & Pharmaceutical Bulletin*, v. 39(12): p. 3276-3278, 1991 (13 ref, Eng).

Chloroform and methanol extracts of the fruits of *M. leucadendron* strongly inhibited histamine release from rat mast cells induced by compound 48/80 or concanavalin A. Ursolic acid, a triterpene, was the most active compound contained in the chloroform extract and two stilbenes, piceatannol and oxyresveratrol, were isolated as active compounds from the methanol extract. Several other stilbenes and related compounds were examined to obtain information on the structure activity relationships of stilbenes.

9204-2311 Varma, R.R., Vijayamma, N. (Indian Institute of Panchakarma, Cheruthuruthy 679531, Kerala, India) **Pharmacological studies on Raktacandana (Pterocarpus santalinus Linn.).** *Journal of Research in Ayurveda and Siddha*, v. 12(3-4): p. 190-199, 1991 (13 ref, Eng).

Decoction of *P. santalinus* heartwood in doses varying from 1 to 8g/kg produced potentiation of pentobarbitone induced hypnosis in albino mice, blocked conditioned

avoidance response in rats and showed anticonvulsant and antiinflammatory activities.

9204-2312 Vito-De Vera, Fe., Manalo, J.B., Bonifacio, S., Unalivia, F.D., Arida, V.P. (Pharmaceutical Chemical Section, Chemicals and Mineral Division, Industrial Technology Development Institute, DOST, Philippines) **Development of an antidiabetic drug from *Lagerstroemia speciosa* (Banaba), Biological studies.** *7th Asian Symposium on Med. Plants, Spices, and Other Natural Prod. (ASOMPS VII). Manila*, 2-7 February 1992 (Eng).

The leaf extracts of *L. speciosa* were spray-dried and the resulting powder was reconstituted at various percentages with appropriate solvent, and tested for hypoglycemic and antidiabetic activities utilizing laboratory mice. Results showed a significant hypoglycemic and antidiabetic activities in mice when administered as powder and as tannin-free extracts. (Abstr. No. TO-16).

9204-2313 Wadood, N., Wadood, A., Shah, S.A.W (Pharmacology Division, Khyber Medical College, Peshawar, Pakistan) **Effect of *Tinospora cordifolia* on blood glucose and total lipid levels of normal and alloxan-diabetic rabbits.** *Planta Medica*, v. 58(2): p. 131-136, 1992 (18 ref, Eng).

The aqueous, alcoholic, and chloroform extracts of the leaves of *T. cordifolia* were administered in doses of 50, 100, 150 and 200 mg/kg body weight to normal and alloxan-diabetic rabbits. The extract exerted a significant (P) hypoglycaemic effect in normal as well as in alloxan-treated rabbits. The extracts, however, had no significant (P<0.05) effect on total lipid levels in normal as well as in alloxan-treated diabetic rabbits. The doses used did not show acute toxicity or result in behavioural changes.

9204-2314 Wu, J.B., Chun, Y.T., Ebizuka, Y., Sankawa, U.* (Faculty of Pharmaceutical Sciences, The University of Tokyo, 7-3-1, Bunkyo-ku, Tokyo 113, Japan) **Biologically active constituents of *Centipeda minima*: Sesquiterpenes of potential anti-allergy activity.** *Chemical & Pharmaceutical Bulletin*, v. 39(12): p. 3272-3275, 1991 (12 ref, Eng).

Ether, methanol and aqueous extracts of *C. minima* herbs were found to have significant antiallergy activities in passive cutaneous anaphylaxis (PCA) test. Three flavonoids, two sesquiterpene lactones and an amide were isolated from this plant material as inhibitors to induced histamine release from mast cells. The sesquiterpenes were identified as isobutyrylplenolin and senecioylplenolin by spectral investigations. The flavonoids and sesquiterpenes

exhibited significant anti-allergy activity in PCA test with p.o. administration.

9204-2315 Wu, T.W., Zeng, L.H., Wu, J. , Carey, D.(Department of Clinical Biochemistry, University of Toronto General Hospital, Toronto, Canada) **Purpurogallin- a natural and effective hepatoprotector in vitro and in vivo.** *Biochemistry and Cell Biology*, v. 69(10&11): p. 747-750 , 1991 (15 ref, Eng).

Purpurogallin (from nutgall) is a plant phenol, from 0.5 to 2.0 mM, purpurogallin prolongs survival of rat hepatocytes substantially against oxyradicals generated with Xanthine oxidase and hypoxanthine. The protection was dose dependent and surpassed that given by antioxidants as ascorbate, mannitol etc. When 1.5, 3 and 6 micro mol of purpurogallin in saline were infused into rats with postischemic liver shortly, before, reperfusion the mean hepatic salvages were 42,76 and 86 percent respectively. Such effects would rank purpurogallin highly among the hepatoprotectors known. Over the range of 31 to 500 microM, it inhibited the rate of oxygen consumption in the xanthine oxidase reaction by 90 percent. Thus purpurogallin is an effective natural hepatoprotector that may operate partly or principally as an inhibition of xanthine oxidase.

9204-2316 Wu, Y.C., Duh, C.Y., Chang, F.R. , Chen, S.L., Wang, S.K.(School of Pharmacy and Department of Microbiology, Kaohsiung Medical College, Kaohsiung, Taiwan, ROC) **Two novel cytotoxic acetogenins from *Annona reticulata*.** *7th Asian Symposium on Med. Plants, Spices and Other Natural Prod.(ASOMPSVII)*. Manilla, 2-7 February 1992 (3 ref, Eng).

Two novel acetogenins, annoreticuin and isoannoreticuin were isolated from *A. reticulata*, collected in Chi-Shan, Kaohsiung Hsein, Taiwan. These two compounds exhibited significant cytotoxicity in A-549 (human lung adenocarcinoma), HT-29 (human colon adenocarcinoma), KB (human nasopharyngeal carcinoma), and P-388 (mouse lymphocytic leukemia) cell culture systems. The structural elucidation of these two novel compounds was achieved by spectral and chemical evidences. (Abstr. No. MP-2).

9204-2317 Wysokinska, H., Skrzypek, Z. , Kunert-Radek, J. (Department of Botany, Institute of Environmental Research and Bioanalysis, Medical Academy, Muszynskiego 1, PL 90-151 Lodz, Poland) **Studies on iridoids of tissue cultures of *Penstemon serrulatus*: Isolation and their antiproliferative properties.** *Journal of Natural Products*, v. 55(1): p. 58-63, 1992 (23 ref, Eng).

Penstemide and serrulatoside as well as penstemide aglycone and serrulatoside aglycone were isolated and

identified in the calli and suspension cultures of *P.serrulatus*. The influence of serrulatoside, penstemide, and its aglycone on the spontaneous proliferation of mouse spleen lymphocytes or hepatoma cells in the Syrian hamster has been estimated in vitro. It has been found that these compounds produce a dose-dependent inhibition of (3H)-thymidine incorporation into the DNA of the examined cells.

9204-2318 Yamada, H., Kiyohara, H., Takemoto, N., Zhao, J.F., Kawamura, H., Komatsu, Y. , Cyong, J.C., Aburada, M., Hosoya, E. (Oriental Medicine Research Center of the Kitasato Institute, Minato-ku, Tokyo 108, Japan) **Mitogenic and complement activating activities of the herbal components of Juzen-Taiho-To.** *Planta Medica*, v. 58(2): p. 166-170, 1992 (10 ref, Eng).

The Kampo (Japanese herbal) medicine "Juzen-Taiho-To" (TJ-48), which was prepared by decocting a concoction(formula), contains ten kinds of herbs and has several immunostimulating activities. In order to determine the contribution of each herbal component, the complement-activating and mitogenic activities of the hot water extract as well as the polysaccharide fraction from each herb were tested. hot water extracts of *Glycyrrhizae radix*, *Astragali radix*, and *Atractylodis lanceae rhizoma* showed significant mitogenic activity whereas that of *Cinnamomi cortex* showed potent complement-activating activity. However, the exclusion of any single component herb whether active or not on its own did not result in a loss or an increase of the overall activity of TJ-48. The polysaccharide fraction from *Glycyrrhizae radix* showed the most potent of both activities among the same fractions from the other nine herbs, and reduced both activities after periodate oxidation, thus indicating that the carbohydrate moiety may contribute to both activities.

9204-2319 Yamahara, J., Kitani, T., Kobayashi, H., Kawahara, Y. (Kyoto Pharmaceutical University, 5, Misasagi, Yamashina-ku, Kyoto 607, Chuo-ku, Osaka 540, Japan) **Studies on *Stachys sieboldii* Miq. II. Anti-anoxia action and the active constituents.** *Yakugaku Zasshi*, v. 110(12): p. 932-935, 1990 (9 ref, Jap, Eng).

During screening for the development of drugs from natural products, methanolic extract of *Stachys sieboldii* tuber significantly inhibited the lethal action induced by KCN in mice. The methanolic extract was fractionated by column chromatography to identify the active constituents. Acteoside and stachysoside C, phenylethanoid glycoside showed significant effect on the KCN-induced anoxia model.

9204-2320 Yaplito, M.A.(West Visayas State University, Iloilo City, Philippines) **Cytotoxic and antiviral assays of**

Barringtonia asiatica (L.), Nerium indicum and N.oleander. *7th Asian Symposium on Med. Plants, Spices and Other Natural Prod.(ASOMPS VII). Manila, 2-7 February 1992 (Eng).*

Expressions from the seeds of *B.asiatica*, alocoholic extracts from the leaves of *N.oleander* (leaves, stem and roots) were assayed for antiviral and anticancer agents, using a plague reduction assay and cytotoxic assay in monolayer culture of Vero African green monkey kidney cells infected with a DNA virus (Herpes simplex type 1, HS-1). The use of serial dilution of the plant extracts in 96 wells microtiter tray allows the identification of the lowest concentration that reduces the number of viral plague for antiviral activity or killing the proliferating monolayer cells for cytotoxic activity. The results showed that *B.asiatica* have 100 percent cytotoxicity from the highest concentration of 0.5 percent to the lowest concentration of 0.0008 percent. It showed 70 percent viral inhibition. *N.oleander* and *N.indicum* extracts also exhibited cytotoxicity and antiviral activity. (Abstr. No. TO-14).

9204-2321 Zhao, G., Hui, Y., Rupprecht, J.K., McLaughlin, J.L.* (Department of Medicinal Chemistry and Pharmacognosy, School of Pharmacy and Pharmacal Sciences, Purdue University, West Lafayette, IN 47907, USA) **Additional bioactive compounds and trilobacin, a novel highly cytotoxic acetogenin, from the bark of *Asimina triloba*.** *Journal of Natural Products*, v. 55(3): p. 347-356, 1992 (24 ref, Eng).

Fractionation of the EtOH extract of the bark *A.triloba* monitoring by brine shrimp lethality, has led to the isolation and structural elucidation of a novel highly cytotoxic Annonaceous acetogenin, trilobacin (1), in addition to six known compounds; asimicin (2), bullatacin (3), bullatacinone (4), N-p-coumaroyltyramine (5), N-trans-feruloyltyramine (6), and (+)-syringaresinol (7). Acetogenin 1 was identified as a diastereomer of asimicin (2) by spectral and chemical methods, and both 1 and 2 showed potent and selective cytotoxicities in the NCI human tumor cell line screen.

9204-2322 Zhao, H.Y., Fang, W.Y.(Department of Internal Medicine, Tongji Hospital, Tongji Medical University, Wuhan 430030, China) **Combined traditional Chinese and western medicine. Antithrombotic effects of Andrographis paniculata Nees in preventing myocardial infarction.** *Chinese Medical Journal*, v. 104(9): p. 770-775, 1991 (12 ref, Eng).

Administration (i.v.) of flavone extract from the root of *A.paniculata* (TFAP) in 8 dogs has shown that TFAP might promote the synthesis of PGI2, inhibit the production of TXA2, stimulate the synthesis of cAMP in platelets,

impede aggregation of platelets, and thereby prevent the formation of thrombi as well as the development of myocardial infarction.

Antimicrobial Activity

9204-2323 Aguinaldo, A.M., Abe, F., Chua, N.M., Croft, K.D., Padolina, W.G., Yamauchi, T., Ysrael, M.C.(Research Center for the Natural Sciences, UST Espana, Manila, Philippines) **Chemical and biological studies on Mikania cordata (Burm. F.) B.L. Robinson.** *7th Asian Symposium on Med. Plants, Spices and Other Natural Prod.(ASOMPS VII). Manila, Philippines*, 2-7 February 1992 (Eng).

Chemical and biological studies were done on the plant *M.cordata* in an attempt to establish the scientific basis for its medicinal uses. Upon isolation and structure elucidation, the plant has yielded sesquiterpene lactones of the germacranolide type, flavonoids, sterol glucosides and glucosyl ceramide. While the crude chloroform extract exhibited antimicrobial and antifungal properties, the purified CHCl3 extract indicated in-vivo antiinflammatory effects. Enhanced microbiological activity as well as antiinflammatory effects were detected on the fraction containing the mixture of sesquiterpene lactones. Scandenolide, the major sesquiterpene lactone isolated, was found to inhibit the production of the inflammatory mediators leukotriene B4, 5-HETE and platelet activating factor by isolated rat peritoneal leukocytes. However, the toxicity shown by the crude extract would limit the use of this medicinal plants. (Abstr. No. MP-13).

9204-2324 Akao, M., Kuroda, K.(Research Centre for Pathogenic Fungi and Microbial Toxicoses, Chiba University, 1-8-1 Inohana, Chiba 280, Japan) **Antifungal activity of fumaric acid in mice infected with *Candida albicans*.** *Chemical & Pharmaceutical Bulletin*, v. 39(11): p. 3077-3078, 1991 (9 ref, Eng).

An examination was made on the effect of fumaric acid (isolated from *Capsella bursa-pastoris*) on an experimental systemic candidiasis. Male ICR mice were inoculated into the tail veins with 10 yeast cells of *C.albicans* and treated with daily intraperitoneal injections of fumaric acid at the dose of 40 mg/kg/d. The results indicated that the administration of fumaric acid was effective in prolonging the survival of animals after the fungal challenge and prevented one-fifth of the treated animals from dying of candidiasis.

9204-2325 Beutler, J.A., Cardellina II, J.H., McMahon, J.B., Boyd, M.R.*., Cragg, G.M.(Laboratory of Drug Discovery Research and Development, National Cancer

Institute, Building 1052, Frederick, Maryland 21702-1201, USA) **Anti-HIV and cytotoxic alkaloids from *Buchenavia capitata*.** *Journal of Natural Products*, v. 55(2): p. 207-213, 1992 (14 ref, Eng).

The anti-HIV activity in the organic solvent extract of leaves of *B.capitata* was traced to a series of known flavonoid alkaloids, which represent a new chemotype for anti-HIV activity. The ¹³C-NMR assignments for this series of compounds have been revised. O-Dimethyl-buchenavianine (1) was the most active compound of the series but produced only moderate cytoprotective effects against HIV in cultured human lymphoblastoid cells. Compound 1 was cytotoxic also in the NC1 human disease-oriented in vitro tumor screening panel and produced a pattern of modest differential cellular sensitivity.

9204-2326 Chua, N.M., Recio, B.V., Madulid, R.S.(Research Center for the Natural Sciences, UST, Philippines) **Antimicrobial activities of the alkaloid bearing plants collected from Palawan.** *7th Asian Symposium on Med. Plants, Spices and Other Natural Products (ASOMPS VII)*. Manila, 2-7 February 1992 (4 ref, Eng).

A total of 479 plant species were collected from Palawan and tested using the Culvenor-Fitzgerald method. Those plant species that gave positive results to alkaloid test were collected in bulk, extracted and subjected to microbiological assay using the agar cup method. Plant species belonging to families Annonaceae, Apocynaceae, Euphorbiaceae, Loranthaceae, Magnoliaceae, Malvaceae, Rubiaceae, Rutaceae and Sapindaceae exhibited varying activities against six ATCC standard microorganisms and an acid-fast bacteria. (Abstr. No. WP-14).

9204-2327 Claeson, P., Radstrom, P., Skold, O., Nilsson, A., Hoglund, S.(Department of Pharmacognosy, Biomedical Center, Box 579, Uppsala University, S-751 23 Uppsala, Sweden) **Bactericidal effect of the sesquiterpene T-cadinol on *Staphylococcus aureus*.** *Phytotherapy Research*, v. 6(2): P. 94-98, 1992 (8 ref, Eng).

The antimicrobial effect of the sesquiterpene T-cadinol, isolated from the Somalian traditional remedy, scented myrrh (resin of *Commiphora guidottii*) were investigated. The compound was found to be active toward *Staphylococcus aureus* and *Trichophyton mentagrophytes*. The minimum inhibitory concentration of T-cadinol on *S.aureus* was 24 micro/ml and the lowest concentration exerting fungicidal effect on *T.mentagrophytes* was 2.3 micro/ml. The influence of T-cadinol cell viability in *S.aureus*, both in different growth-phases, and in the absence and presence of chloramphenicol, was studied. It could be concluded that T-cadinol has a bactericidal rather

than a bacteriostatic effect, which acts also in the absence of growth. The use of scented myrrh in traditional medicine as a remedy for wounds may then be in congruence with this bactericidal effect of T-cadinol toward the common wound pathogen *S.aureus*.

9204-2328 Dobhal, M.P., Joshi, Y.C.(Chemical Laboratories, University of Rajasthan, Jaipur 302004, India) **In vitro antimicrobial efficacy of *Berberis chitria*.** *Fitoterapia*, v. 63(1): p. 69-70, 1992 (5 ref, Eng).

Ethanic and aqueous extracts of *B.chitria* roots were found to be useful in the treatment of eye infections or conjunctivitis.

9204-2329 Dominguez, X.A., Sanchez, H.V., Garcia, S.G., Espinosa, G.B., Williams, H.J., Ortiz, C., Scott, A.I., Reibenspies, J.H.(Departamento de Quimica, Instituto Tecnologico y de Estudios Superiores de Monterrey, Sucursal de Correos "J", Monterrey, N.L. 64849, Mexico) **Isolation and identification of xochitoldione and isoxochitlolone from *Cnidosculus urens*.** *Journal of Natural Products*, v. 55(2): p. 221-224, 1992 (3 ref, Eng).

Major components of MeOH extracts from the plant roots of *C.urens* purified by cc and tlc and crystallization were lupeol acetate and the previously unreported compounds isoxochitlolone and xochitoldione, which were identified through mass, ir, nmr, and uv spectroscopy and X-ray crystallography. In preliminary testing, isoxochitlolone has been found to be active against *Escherichia coli* and *Staphylococcus aureus*.

9204-2330 Gopal, R.H., Vasanth, S., Kundu, A.B.(Captain Srinivasa Murthi Drug Research Institute for Ayurveda, Arumbakkam, Madras 60016, TN, India) **Testing of essential oil of *Artemisia parviflora* on bacteria.** *Journal of Research in Ayurveda and Siddha*, v. 12(3-4): p. 206-210, 1991 (9 ref, Eng).

Essential oil of *Artemisia parviflora* showed inhibitory activity against gram positive organisms viz., *Staphylococcus aureus*, *S.citreus* and *Bacillus subtilis*.

9204-2331 Habtemariam, S., Gray, A.I., Waterman, P.G. (Phytochemistry Research Laboratories, Department of Pharmacy, University of Strathclyde, Glasgow G1 1XW, Scotland, UK) **Antibacterial diterpenes from the aerial parts of *Premna oligotricha*.** *Planta Medica*, v. 58(1): p. 109-110, 1992 (5 ref, Eng).

The crude ethanolic extract of *P.oligotricha* showed antimicrobial activity against a range of Gram-positive bacteria. This activity increased during the various purification steps and finally led to the isolation of two compounds showing activity. The identification of one of these, 3, and

of another inactive compound, 2, isolated from another fraction, has been described (3). The other active compound was identified as 4 on the basis of spectroscopic data and its comparison with that published previously (4). The ¹H-NMR spectrum indicated the presence, in deuteriochloroform solution of the two C-16 epimers, in an approximate ratio of 17:3. The activity of 3 was marginal that of 4 was good, almost comparable with streptomycin.

9204-2332 Johri, J.K., Banerji, R., Chaurasia, R.S., Misra, G., Siddiqui, S.A. , Balasubrahmanyam, V.R., Nigam, S.K.(National Botanical Research Institute, Lucknow 226001, India) **Coumarins as potent biocides against *Colletotrichum capsici* and *Phytophthora palmivora*.** *Fitoterapia*, v. 63(1): p. 78-80, 1992 (7 ref, Eng).

A number of coumarins of plant origin were evaluated as potent fungicides to help to prevent the loss of crop *Piper betle*. Xanthotoxin was found to have activity similar to synthetic fungicides, blitox and streptocycline. The LD₅₀ of xanthotoxin was determined as 500 mg/kg p.o. in albino rats.

9204-2333 Kasai, S., Watanabe, S., Kawabata, J., Tahara, S., Mizutani, J.(Department of Agricultural Chemistry, Faculty of Agriculture, Hokkaido University, Kita-ku, Sapporo 060, Japan) **Antimicrobial catechin derivatives of *Agrimonia pilosa*.** *Phytochemistry*, v. 31(3): p. 787-789, 1992 (9 ref, Eng).

In a chemical investigation of the roots of *Agrimonia pilosa*, three novel catechin derivatives have been isolated. Their structure and stereochemistry were established on the basis of chemical and spectroscopic evidence. They showed antibacterial activity against *Staphylococcus aureus*.

9204-2334 Kedzia, B., Krzyzaniak, M. , Holderna, E.(Instytut Roslin i Przetworow Zielarskich, ul. Libelta 27, 61-707 Poznan, Polska) **Effect of yarrow essential oil (Ol. Millefolii) and its components on pathogenic microorganisms.** *Herba Polonica*, v. 36(3): p. 117-125, 1990 (Recd. 1992, 31 ref, Eng).

Chamazulene (13.0), beta-caryophyllene (68.2) and beta-caryophyllene oxide (7.8 percent) have been found to be principal constituents of essential oil of *Achillea millefolium*. Cineol, beta-pinene, borneol, camphene, terpineol, camphor, alpha-humulene, bornyl acetate and alpha-pine were also isolated and identified. The essential oil exhibited strong inhibitory activity against *Staphylococcus aureus* cocci and *Candida albicans*. Weak activity against *Escherichia coli* was also observed. Chamazulene showed strongest activity. Borneol, terpineol, camphor and bornyl acetate also showed activity against microorganisms.

9204-2335 Lerma, N.V., Sarile, A.S., Yu, E.L. , Cobar, A.S., Deang, J.V.(Faculty of Pharmacy, UST, Philippines) **Isolation of the antimicrobial constituents of *Coleus blumei* Benth.** *7th Asian Symposium on Med.Plants, Spices and Other Natural Prod.(ASOMPS, VII).* Manila, 2-7 February 1992 (4 ref, Eng).

The leaves of *C. blumei* (Mayana), are reportedly used in the treatment of headaches, bruises, dyspepsia, mild bleeding, boils, sore eyes and burns. To establish the scientific basis for this phytochemical and biological screenings were done. Presence of hydrocarbons, sterols, flavonoids, saponins, tannins and sugars was indicated. Microbiological assay showed that the crude alcoholic extract of the leaves inhibited the growth of *E.coli*, *S.aureus*, *P.vulgaris* and *B.subtilis*. The crude alcoholic extract was subjected to bioassay directed separation. The semipolar fraction and an active component showed significant activity against *S.aureus*. (Abstr. No. WP-12).

9204-2336 Mishra, A.K., Dwivedi, S.K. , Kishore, N., Dubey, N.K. (Herbal Pesticides Laboratory, Centre of Advanced Study in Botany, Banaras Hindu University, Varanasi 221005, UP, India) **Fungistatic properties of essential oil of *Cinnamomum camphora*.** *International Journal of Pharmacognosy*, v. 29(4): p. 259-262, 1991 (10 ref, Eng).

The oil of *C.camphora* was found to possess mycostatic effect against *Aspergillus flavus* at 4000 ppm. Moreover the oil was found to be as potent as some synthetic preservatives commonly used in storage of food stuffs-viz. ceresan, copper oxychloride, dithane M-45 and thiavit.

9204-2337 Nishina, A., Uchibori, T.* (Food Research Laboratory, Nippon Oil & Fats Co., Ltd. Toshima 4-18-11, Kita-ku, Tokyo 114 Japan) **Antimicrobial activity of 2,6-dimethoxy-p-benzoquinone, isolated from thick-stemmed bamboo and its analogs.** *Agricultural and Biological Chemistry*, v. 55(9): p. 2395-2398, 1991 (11 ref, Eng).

The benzoquinone derivatives (BQ) used for assessing antimicrobial potency were, methyl p-benzoquinone (MBQ), thymoquinone (TQ) and six other compounds. The minimum inhibitory concentration (MIC) of each sample was measured by using two fold dilution method. MBQ and TQ showed strong antibacterial effect, especially to gram-positive bacteria. MIC of benzoquinone derivatives (BQ) to six fungi, showed that BQ and those groups having methyl group and methoxy group showed antifungal activity.

9204-2338 Ontenggo, D.C.(Medical Affairs, United Laboratories, Inc., Mandaluyong, Metro Manila, Philippines) **The in vitro antibacterial activity of *Jatropha***

multifida Linn. against common bacterial wound isolates. 7th Asian Symposium on Med. Plants, Spices and Other Natural Prod. (ASOMPS VII.) Manila, 2-7 February 1992 (Eng).

Preliminary screening analyses using Disk Diffusion and Tube Dilution Methods on the latex of *J. multifida* show that *Staphylococcus aureus* ATCC 25923 is susceptible to the latex with a moderate inhibitory zone of 13.6 mm. and MIC of 0.098 percent. Agar-Disk diffusion tests using 102 bacterial wound isolates show that 50 percent aqueous solution of *J. multifida* latex is as effective as the 100 percent concentration. (Abstr. No. WP-11).

9204-2339 Pereda-Miranda, R., Hernandez, L., Lopez, R. (Laboratorio de Fitoquímica, Departamento de Farmacia (DEPg), División de Bioquímica y Farmacia, Facultad de Química, Universidad Nacional Autónoma de México, Coyacan 04510, Mexico, D.F.) **Novel antimicrobial abietane-type diterpene from *Salvia albocaerulea*.** *Planta Medica*, v. 58(2): p. 223-224, 1992 (13 ref, Eng).

The isolation and structure determination of a novel diterpene, 15-hydroxy-7-oxo-abieta-8,11,13-triene, which was found to be responsible, together with sugiol, for the antimicrobial activity of *S. albocaerulea* is described. The known cytotoxic pentacyclic triterpenoids ursolic, máslinic and 2alpha-hydroxyursolic acids, in addition to oleanolic acid were identified using the brine shrimp larvicidal assay.

9204-2340 Ranjan, K.S., Sahay, S.S., Choudhary, A.K. (Department of Botany, Bhagalpur University, Bhagalpur 812007, Bihar, India) **Efficacy of spices against aflatoxin synthesis.** *Geobios*, v. 19(1): p. 38-39, 1992 (6 ref, Eng).

Among the flur spices tried, only cardamom and turmeric showed better 90 percent inhibitory activities against aflatoxin synthesis, while red pepper and ginger resulted in 42 percent and 67 percent inhibition, respectively. Inhibition in aflatoxin production has been assigned to presence antiaflatoxigenic substances in the spices.

9204-2341 Satinder Kaur, Sinha, G.K. (Chemical Laboratory, Govt. PG College, Rishikesh 249201, UP, India) **In vitro antifungal activity of some essential oils.** *Journal of Research in Ayurveda and Siddha*, v. 12(3-4): p. 200-205, 1991 (6 ref, Eng).

Essential oils of *Artemisia vestita*, *Zingiber officinale*, *Ocimum basilicum*, *Piper longum*, *O. sanctum*, *Mentha arvensis*, *Trachyspermum ammi*, *Erigeron linigolius* and some of their important constituents exhibited anifungal activity against seven pathogenic fungi.

9204-2342 Seth, R., Saibebe, A., Morisco, P. (National Research and Training Institute of Traditional Medicine, Department of Health, Ministry of Social Services, Royal Government of Bhutan, P.O.Box 258, Thimphu, Bhutan) **Antibacterial and antimicotic activities of selected Bhutanese traditional medicinal plants.** 7th Asian Symposium on Med. Plants, Spices, and Other Natural Prod. (ASOMPS VII). Manila, 2-7 February 1992 (Eng).

The antibacterial and antimicotic activity of twenty selected traditonal plants. Fractions of seven plants out of twenty showed varying degree of antibacterial and antimicotic activities. (Abstr.No. WP-13).

9204-2343 Singh, S.P., Negi, S., Laxmi Chand, Singh, A.K. (Department of Microbiology, College of Basic Sciences & Humanities, GB Pant University of Agriculture and Technology, Pantnagar 263145, UP, India) **Antimicrobial properties of essential oils from *Zingiber chrysanthum* leaves and rhizomes.** *Fitoterapia*, v. 63(1): p. 73-75, 1992 (5 ref, Eng).

Essential oils from rhizomes and leaves of *Z. chrysanthum* displayed marked antifungal activity against several potent plant pathogens eg., *Alternaria* spp., *Fusarium* spp., *Aspergillus parasiticus* and *Cochliobolus sativus*. The oils were effective against wide range of gram positive and gram negetive bacteria.

9204-2344 Singh, S.P., Singh, S.P., Negi, S., Laxmi Chand, Singh, A.K. (Department of Microbiology, College of Basic Sciences and Humanities, GB Pant University of Agriculture and Technology, Pantnagar 263145, UP, India) **Antibacterial and antifungal activities of *Mentha arvensis* essential oil.** *Fitoterapia*, v. 63(1): p. 76-78, 1992 (3 ref, Eng).

Essential oil of *M. arvensis* leaves displayed distinct antifungal and antibacterial activities. Many of the test fungi were potent plant pathogens. Use of *M. arvensis* oil as an antimicrobial agent during storage of grains and other edibles has been suggested.

9204-2345 Ushio, Y., Abe, H. (The Research Institute of Oriental Medicine, Kinki University, Osaka 589, Japan) **Inactivation of measles virus and herpes simplex virus by saikosaponin D.** *Planta Medica*, v. 58(2): p. 171-173, 1992 (16 ref, Eng).

Saikosaponin d, isolated from the roots of *Bupleurum falcatum* at a concentration of more than 5 microM had direct inactivating effect on both measles virus and herpes simplex virus after inncubation of the viruses with the agent for more than 10 min at room temperature. In contrast, exposure of poliovirus to even 500 microM of saikosaponin d resulted in no loss of infectivity, while the same concentra-

tion of saikosaponin d induced complete loss of infectivity in both measles virus and herpes virus. In addition, saikosaponin d was ineffective against the replication of measles virus, herpes virus, and polio virus at a concentration of 0.1 microM whereas saikosaponin d did not induce an inhibitory effect on the growth of Vero cells. When Vero cells were treated with saikosaponin d 24 h before the inoculation (pretreatment) and immediately or 24 h after the infection of the viruses (post-treatment).

9204-2346 Yariwake Vilegas, J.H., Hachich, E.M., Garcia, M., Brasileiro, A., Carneiro, M.A.G., Campos, V.L.B. (Laboratorio de Cromatografia, Instituto de Quimica e Fisica de Sao Carlos, USP, C.Postal 369, 13.560, Sao Carlos, SP, Brazil) **Antifungal compounds from Apocynaceae species.** *Revista Latinoamericana de Quimica*, v. 22(4)+23(1): p. 44-45, 1992 (6 ref, Eng).

Bioassay-directed chromatographic fractionation of ethyl acetate extracts from the roots of *Himathanthus obovatus* and roots of *Allamanda doniana* afforded the known iridoids plumericin and isoplumericin as active components responsible for the antifungal activity of crude extracts. *A. doniana* extracts also afforded inactive coumarin scopoletin.

Insecticidal & Piscicidal Activity

9204-2347 Agrawal, I.L. (Division of Entomology, Directorate of Pulses Research, Kalyanpur, Kanpur 208024, UP, India) **Ovicidal activity of some phytochemicals on *Mylolocerus undecimpustulatus* Faust. Coleoptera: Curculionidae.** *Indian Journal of Entomology*, v. 52(1): p. 35-38, 1990 (11 ref, Eng).

The ovicidal activity of some indigenous plant chemicals like the fraction C, and thionemone (two different preparations of *Azadirachta indica* seeds) extract of *Swietenia macrophylla* seed, extract of *Calophyllum inophyllum*. Seed and the extract of *A. indica* was tested against the eggs of *Mylolocerus undecimpustulatus*. All the treatments were found to be significantly superior to controls. The effect of thionemone, fraction C and *S. macrophylla* seed extracts were at par (100 per cent mortality) and superior to *Calophyllum* (94.66 per cent mortality) and heartwood extract was inferior (76.0 per cent mortality) to *Calophyllum* seed extract. NSL, New Delhi.

9204-2348 Ayyangar, G.S.G., Rao, P.J. (Division of Entomology, IARI, New Delhi 110012, India) **Changes in haemolymph constituents of *Spodoptera litura* Fabr. under the influence of Azadirachtin.** *Indian Journal of Entomology*, v. 52(1): p. 69-83, 1990 (54 ref, Eng).

The effect of an injected dose of azadirachtin (1 micro gm/gm) on some haemolymph constituents of the last larval instar of *S. litura* was examined. Azadirachtin decreased total haemocyte count, protein, trehalose uric acid, calcium and magnesium concentrations. However it increased ninhydrin positive substances, sodium and potassium concentrations. It has no effect on the electrophoretic pattern of haemolymph proteins and esterases. NSL, New Delhi.

9204-2349 Chockalingam, S., Kuppusamy, A., Punithavathy, G., Manoharan, T. (Zoological Research Laboratory, Thiagarajor College, Madurai 625009, TN, India) **Synergistic effect of insecticides with plant extracts against filarial vector, *Culex quinquefasciatus*.** *Journal of Applied Zoological Research*, v. 2(2): p. 92-95, 1991 (6 ref, Eng).

Biological activities of two insecticides (fenthion and decis) and extracts of two plant, *Anona squamosa* and *Ipomoea carnea* against different aquatic stages of *C. quinquefasciatus* were studied. Fenthion was more toxic than decis. The larvicidal and pupicidal effect of plant extracts indicated that *A. squamosa* was highly effective in suppressing the larval population. Insecticides and plant extracts. Combined in 1:1 ratio revealed that mixtures of fenthion with *I. carnea* and *A. squamosa* showed synergistic effect while decis in combination with *A. squamosa* and *I. carnea* produced antagonistic effect. NSL, New Delhi.

9204-2350 Guzman, R.S., Ambros, F.A. (Vsabela State University, Cabagan, Isabela, Philippines) **Effectiveness of *Nerium indicum* as insecticide to the house pest *Blatta orientalis* (cockroaches).** *7th Asian Symposium on Med. Plants, Spices and Other Natural Prod. (ASOMPSVII)*. Manila, 2-7 February 1992 (2 ref, Eng).

Study was conducted to determine whether the sap of adelfa (*N. indicum*) bark-extracted by boiling in water for 35 minutes could be effective as an insecticide. The extracts obtained with different weights of air-dried adelfa bark to a constant volume of water (Set A treatments) were tested including extracts where kerosene (Set B treatments) and alcohol (Set C treatments) were added. The tests were conducted in a laboratory using completely randomized design as a statistical tool. Results showed that sap of adelfa bark-extracted in the proportion of 30,20 and 10g per 200 ml of water were as effective as the commercial household insecticide. The addition of 25 ml of kerosene with 100 ml of extracts resulted into higher activity. Alcohol as additive to the extracts was likewise effective. Adelfa bark extract could be an alternative insect pest control material which could be prepared easily involving a very minimal cost. Caution should be undertaken to protect the health of the processor and the end user. (Abstr. No. WP-26).

9204-2351 Hai, M.A., Sikder, E.H., Ahmad, M.U.(Department of Chemistry, Jahangirnagar University Savar, Dhaka, Bangladesh) **Chemical constituents and insecticidal activity of *Ipomoea fistulosa* (Convolvulaceae).** *7th Asian Symposium on Med. Plants, Spices, and Other Natural Prod. (ASOMPS VII).* Manila, 2-7 February 1992 (Eng).

Preliminary laboratory experiments with the aqueous extract of *I. fistulosa* showed it to have positive effect against a number of common insects. Two solid compounds and two oily substances have been separated from the alcoholic extract of the dried plant after solvent fractionation and column chromatography. Structures of these compounds as well as the effect of the aqueous extract and the four compounds on various insects were presented. (Abstr.No. WP-25).

9204-2352 Hashidoko, Y., Tahara, S., Mizutani, J.(Mizutani Plant Ecochemicals Project, Eniwa RBP Centre Building, Megumino Kita 3-Chome, Eniwa-shi 061-13, Japan) **Rugosal A and related carotane sesquiterpenes in the glandular trichome exudate of *Rosa rugosa*.** *Phytochemistry*, v. 31(3): p. 779-782, 1992 (15 ref, Eng).

The glandular trichome exudate of *Rosa rugosa* leaves is mainly composed of two major carotane sesquiterpenes, rugosal A and rugosic acid A, and carota-1,4-dienaldehyde was also present. The occurrence of rugosal A in the exudate suggests a possible defensive role of the glandular trichome against pest organisms, as it has antifeedant activity against tobacco cutworm larvae.

9204-2353 Lobo, P.P.G., Llagas, M.A., Laysa, F.D.(Department of Agriculture, Region V. San Agustin, Pili, Camarines Sur, Philippines) **Evaluation of starflower (*Calotropis gigantea*) against golden apple snail (*Pomacea canaliculata*) in lowland transplanted rice.** *7th Asian Symposium on Med. Plants, Spices, and Other Natural Prod. (ASOMPS VII).* Manila, Philippines, 2-7 February 1992 (1 ref, Eng).

Starflower (*C. gigantea*) (dried and milled leaves) was evaluated against the golden apple snail. Its molluscicidal activity was compared with Paradise *Melia azadirach* and its effective application rate that will prevent crop damage by golden snail was determined. Within the first few hours after treatment was applied, snails tended to move out of the starflower and climbed out of the containers. Later, they appeared to lose their foothold on the sides of the containers and fell to the bottom. After 24 hours they hardly moved from the original position. Death was observed to start between 24 and 48 hours. The effective application rate of starflower leaves which consistently gave better performance than the other rates and generally compared favourably with the chemical standard in terms of snail

control and crop protection was 200 kg/ha. Starflower is a new plant evaluated for molluscicidal activity. It offers a solution to the tremendous crop loss due to golden snails without causing any hazards to man and his environment. (Abstr.No. MP-21).

9204-2354 Morallo-Rejesus, B., Maini, H.A. , Dayrit, F., Quintana, E.(Department of Entomology, College of Agriculture, UP Los Banos, Laguna, Philippines) **Biocidal action of some medicinal plants to insects.** *7th Asian Symposium on Med. Plants, Spices, and Other Natural Prod. (ASOMPS VII).* Manila, 2-7 February 1992 (2 ref, Eng).

The biological activity of 18 medicinal plants was evaluated against six insects. The medicinal plants were: *Aristolochia elegans*, *A. tagala*, *Tinospora crispa*, *Vitex negundo*, *V. trifolia* var. *littoralis*, *Blumea balsamifera*, *Coleus amboinicus*, *Chrysanthemum indicum*, *Ageratum conyzoides*, *Tithonia diversifolia*, *Derris philippinensis*, *D. elliptica*, *Caesalpinia pulcherrima*, *Curcuma longa*, *Gliricidia sepium*, *Premna odorata*, *P. nauseosa* and *Chromolaena odorata*. Among the test plants, *T. crispa*, *V. negundo* and *Derris spp.*, exhibited pronounced insecticidal activity. (Abstr.No. TO-25).

9204-2355 Noriel, L.M., Vasquez, E.A.(Department of Plant Protection, VISCA, Baybay, Leyte, Philippines) **Preliminary survey and identification of plant species with pesticidal potential in Mt. Pangasugan.** *7th Asian Symposium on Med. Plants, Spices and Other Natural Prod. (ASOMPS VII).* Manila, 2-7 February 1992 (Eng).

A preliminary survey and identification of plant species with pesticidal potential in Mt. Pangasugan (located at Baybay, Leyte, Philippines) based on existing literatures were conducted. The results indicated that extracts of *Mikania cordata* and *Cassia alata* were the most fungitoxic against *Rhizoctonia solani*, *Helminthosporium oryzae*, *Sclerotium rolfsii* and *Collectotrichum gleosporoides* whereas those of *Dioscorea hispida*, *Tinospora rhumphii*, *Peperomia pellucida*, *C. alata* and *Portulaca oleracea* were effective against root-knot nematodes. However, none of the plants exhibited toxicity against sweet potato weevil; some plant species seemed to have repellent activity.

9204-2356 Odyek, O., Makanga, B., Byaruhanga, M.A.(Makerere University, PO Box 7062, Kampala, Uganda) **Larvicidal and molluscicidal activities of *Solanum aculeastrum* berry methanol extract.** *Fitoterapia*, v. 63(1): p. 71-72, 1992 (8 ref,

Methanol extract of *S. aculeastrum* berries was found to be more toxic to the snails than to the mosquitoes larvae. Irrespective of species, a larger body snail absorbed more extract than a smaller one.

9204-2357 Ramathal, D.C., Kigodi, P.G.K.(Department of Pharmacognosy, Faculty of Medicine, Muhimbili Medical Centre, P.O.Box 65013, Dares-Salaam, Tanzania) **Molluscicidal activity of plants available in Tanzania.** *Ethnobotany*, v. 3(1&2): p. 57-64, 1991 (15 ref, Eng).

Forty plants samples from 23-families have been screemed, using *Biomphalaria glabrata* snails, of which 19-had molluscicidal activity. Some ethnobotancial information on the plants found to have the molluscicidal activity is given NSL, New Delhi.

9204-2358 Ravelonjato, B., Libot, F. , Ramiandrasoa, F., Kunesch, N.*., Gayral, P., Poisson, J.(Laboratoire de Chimie des Substances Therapeutiques Naturelles, Faculte de Pharmacie, F-92296 Chatenay-Malabry Cedex, France) **Molluscicidal constituents of *Calophyllum* from Madagascar: Activity of some natural and synthetic neoflavanoids and khellactones.** *Planta Medica*, v. 58(1): p. 51-55, 1992 (32 ref, Eng).

Crude extracts of seeds, leaves and barks of four Madagascan *Calophyllum* species; *C.inophyllum*, *C.recedens*, *C.chapelieri* and *C.verticillatum*, have been tested for molluscicidal activity against *Biomphalaria glabrata*. All seed extracts showed significant activity. The major constituents of the most active *Calophyllum* species were examined. Some related coumarinic derivatives were synthesized in order to improve the biological activity. Among the compounds prepared, 5,7-dihydroxy-6-(2-methylbutyryl)-4-phenyl-coumarin presented an interesting molluscicidal activity.

9204-2359 Rojas de Arias, A., Schmeda-Hirschmann, G. , Falcao, A. (Instituto de Investigaciones en Ciencias de la Saluda (I.I.C.S), Rio de la Plata y La Gerenza, C.P.2511, Asuncion, Paraguay) **Feeding deterency and insecticidal effects of plant extracts on *Lutzomyia longipalpis*.** *Phytotherapy Research*, v. 6(2): p. 64-67, 1992 (13 ref, Eng).

Papers impregnated with seventeen extracts and three essential oils derived from nineteen plant species were assayed for insecticidal effect on *L.longipalpis* sandflies. Five extracts significantly increased the mortality rates when compared with controls. Six extracts and two essential oils were assessed after application to hamsters for repellency/antifeedant effects on the flies. *Bixa orellana* seed extract and *Bulnesia sarmientoi* essential oil elicited a strong feeding inhibition at 2.50-1.25 micro/cm² skin.

9204-2360 Serit, M., Ishida, M., Kim, M. , Yamamoto, T.* (Central Research Laboratories, Taiyo Kagaku Co., Ltd., 1-3 Takaramachi, Yokkaichi, Mie 510, Japan) **Antifeedants from *Citrus natsudaidai* Hayata against**

termite *Reticulitermes speratus* Kolbe. *Agricultural and Biological Chemistry*, v. 55(9): p. 2381-2385, 1991 (10 ref, Eng).

The lower precipitated layer of a methanol extract of *C.natsudaidai* seeds, when applied to paper discs at a dosage ranging from 500 to 2000 microg/disc, significantly deterred feeding by *Reticulitermes speratus* nymphs. Three termite antifeedant limonoids (i.e, obacunone, nomilin and limonin) were identified as the active principles. Obacunone (with a minimum effective dosage of 150 microg/disc) was about two-fold more active than nomilin. Limonin was weak even at 1000 microg/disc.

9204-2361 Singh, K.K., Singh, A., Singh, R.(Virus Research Laboratory, Department of Botany, Agra College, Agra 282002, UP, India) **Antiviral activity of plant extracts as the ineffectivity of groundnut mosaic virus in vitro.** *Journal Mendel*, v. 9(1): p. 7-8, 1992 (5 ref, Eng).

Out of 8-plant extracts tested, only 4-were found inhibitory to the virus. Of which *Opuntia* extract was found to be very phytotoxic to the virus. Virus infectivity was increased by decreasing the contact period between host and inhibitors. Seed extracts of *Argemone*, leaf extracts of *Ocimum* and *Eucalyptus* and bulb of *Allium* gave 49.63 percent inhibition while seed extracts of *Solanum*, *Datura*, and *Oryza* gave only 22.31 percent of inhibition. Maximum inhibition percentage was recorded with bulb of *Allium*(62.64 percent. NSL, New Delhi.

9204-2362 Sukari, M.A., Rahmani, M. , Takahashi, S.(Department of Chemistry, Universiti Pertanian Malaysia, 43400 UPM Serdang) **Studies on the chemical constituents and piscicidal activity of some tropical plants.** *7th Asian Symposium on Med. Plants, Spices and Other Natural Prod.(ASOMPS VII)*. Manila, 2-7 February 1992 (Eng).

Toxicity tests of extracts of *Ocimum sanctum*, *Isotoma longiflora*, *Antidesma tomentosum*, *Rhizophora mucronata* and *Rhizophora apiculata* were carried out on fish. Further work of *O.sanctum*, *Tabernaemontana polynuera*, *T.divaricata* and *Zanthoxylum ancanthopodium* has led to the isolation and elucidation of triterpenes and alkaloids. (Abstr. No. WP-24).

9204-2363 Vijaya Kumar(Department of Chemistry, University of Peradeniya, Peradeniya, Sri Lanka) **Biopesticides from Sri Lankan plants.** *7th Asian Symposium on Med. Plants, Spices and Other Natural Prod.(ASOMPS VII)*. Manila, 2-7 February 1992 (Eng).

The screening of selected Sri Lankan plants for insecticidal, fungicidal and herbicidal activiuty resulted in the identification of several plants, with a wide range of ac-

tivities. Some families like the Rutaceae and the Meliaceae have a high percentage of active extracts. Logianaceae gave extracts with little or no activity. Some plants of families Lauraceae and Tiliaceae have tended to give extracts with a particular type of activity, e.g. the nematocidal and acaricidal activities. (Abstr. No. TO-24).

Phytochemistry

9204-2364 Abdul Samah, O., Puteh, M.F. , Selamat, J.* (Department of Food Science, University of Agriculture Malaysia, 43400 Serdang, Malaysia) **Acidity and flavour potential in cocoa beans fermented with *Saccharomyces cerevisiae* (Wild strain).** *7th Asian Symposium on Med. Plants, Spices and Other Natural Prod. (ASOMPS VII)*. Manila, 2-7 February 1992 (2 ref, Eng).

Cocoa samples were analysed for glucose, ethanol, volatile and non-volatile acid levels including sensory evaluation test. The overall PH profile of the cotyledon in the inoculated beans during fermentation was slightly higher than the control beans. After roasting the pH of the inoculated beans was 5.05, which by Malaysian standard, was reasonably good although it may be inferior to the Ghanaian beans, pH 5.8. The percentage of glucose remaining in the pulp of both the inoculated and control beans at the end of fermentation were 20 percent and 3 percent respectively. It is assumed that much of the glucose has been converted to ethanol and acids by the microorganism. The intensity of chocolate flavour obtained from the inoculated and control beans was almost the same. However, in the inoculated beans bitterness was reduced by 28 percent. (Abstr. No. MP-32).

9204-2365 Abe, F., Mori, Y., Yamauchi, T. (Faculty of Pharmaceutical Sciences, Fukuoka University, 8-19-1 Nanakuma, Jonan-ku, Fukuoka 814-01, Japan) **3'-epi-19-Norafroside and 12beta-hydroxycoroglaucigenin from *Asclepias curassavica*.** *Chemical & Pharmaceutical Bulletin*, v. 39(10): p. 2709-2711, 1991 (9 ref, Eng).

3'-epi-19-Norafroside, a 19-norcardenolide glycoside with dual linkages between a cardenolide and 4,6-dideoxy-galactos-2-ulose, and 12beta-hydroxycoroglaucigenin were newly isolated from the stem of *A.curassavica* along with known glycosides and free cardenolides. The structures were determined by spectral and chemical methods.

9204-2366 Achmad, S.A., Hakim, E.H., Makmur, L. (Department of Chemistry, Institut Teknologi Bandung, Jalan Ganeca 10, Bandung 40132, Indonesia) **Some new and bioactive sesquiterpenes from *Cryptocarya densiflora*, *Neolitsea cassiaeifolia* and *Litsea amara* (Fam.**

Lauraceae). *7th Asian Symposium on Med. Plants, Spices and Other Natural Prod. (ASOMPS VII)*. Manila, 2-7 February 1992 (2 ref, Eng).

Studies on the isolation and structure elucidation of some new and bioactive sesquiterpenes indonesiol, linderane, pseudolinderadine, zeylanidine, fischeric acid, isofischeric acid and fischerilactonic acid isolated from several species of Lauraceae have been reviewed. (Abstr. No. WO-2).

9204-2367 Addae-Mensah, I., Muriuki, G. , Karanja, G., Wandera, C. , Waibel, R. , Achenbach, H. (Department of Pharmacy, University of Nairobi, Kenya) **Constituents of the stem bark and twigs of *Croton macrostachy*(u)s.** *Fitoterapia*, v. 63(1): p. 81, 1992 (3 ref, Eng).

Lupeol, betulin, five fatty acids along with previously isolated crotepoxide were isolated from the stem bark and twigs of *C.macrostachyus*.

9204-2368 Addy, M.E. (Department of Biochemistry, University of Ghana, P.O.Box 54, Legon, Philippines) **The chemical structure and mode of action of some compounds present in *Desmodium adscenens*.** *7th Asian Symposium on Med. Plants, Spices and Other Natural Prod. (ASOMPS VII)*. Manila, 2-7 February 1992 (Eng).

The structures of three chemically different groups of compounds, triterpenoid saponins, beta-phenylethylamines and tetrahydroisoquinoline, isolated from *D.adscenens* are given, and their effects on plasma membrane ion channels, cytochrome P450 NADPH-dependent oxygenation of arachidonic acid, and production of prostaglandins by the cyclooxygenase enzyme system, are presented. These effects are discussed with respect to the therapeutic action of *D.adscenens* in diseases caused by defects in plasma membrane signal transducing systems involving smooth muscle contraction/relaxation. (Abstr. No. TP-21).

9204-2369 Agarwal, T., Tiwari, J.S. (Department of Chemistry, Ravishankar University, Raipur 492010, MP, India) **A note on the flavanoid and other constituents of *Phyllanthus* genus.** *Journal of the Indian Chemical Society*, v. 68(8): p. 479-480, 1991 (3 ref, Eng).

Air dried methanol extract yielded quercetin-3-O-beta-D-glucopyranosyl(1 to 4) alpha-L-hamnopyranoside, 3,5,7,4'-tetrahydroxyflavone. Petroleum-ether extracts yielded lupeol, alpha-amyrin and 32-methyl-1-triacontanol.

9204-2370 Aguinaldo, A.M., Espeso, E.I. , Garcia, C.P., Guevara, B.Q., Nonato, M.G. , Recio, B.V. (Research Centre for the Natural Sciences, UST) **Alkaloid studies on selected Philippine plants.** *7th Asian Symposium on Med.*

Plants, Spices, and Other Natural Prod. (ASOMPS VII). Manila, 2-7 February 1992 (3 ref, Eng).

A systematic search for alkaloids from 1000 plants was conducted in selected areas and virgin forests of Luzon, Palawan and Mindoro. A total of more than 70 samples, belonging to different genera, gave positive results for alkaloids. Fresh and air-dried samples were ground, extracted with alcohol; from the concentrated alcohol extracts, alkaloids were fractionated by the usual acid-base extraction. Purification was conducted by repeated chromatographic methods. The structure elucidation of the pure alkaloid was conducted by chemical and spectroscopic methods. The structure of the alkaloids isolated and identified were discussed. (Abstr. No. MO-2).

9204-2371 Ahmad, M.U., Huq, E., Sutradhar, R.K. (Department of Chemistry, Jahangirnagar University, Savar, Dhaka, Bangladesh) **Chemical constituents of *Luffa echinata*.** *7th Asian Symposium on Med. Plants, Spices and Other Natural Prod. (ASOMPS VII). Manila, 2-7 February 1992 (Eng).*

The aqueous extracts of the dried fruits of *L. echinata* are extensively used by the Ayurvedists for the treatment of jaundice. Chloroform extract of the dried fruits of *L. echinata* led to the isolation of four new triterpenes (m.p.s. 209 degree, 228 degree, 172 degree and 258 degree) related to the cucurbitacins. The chloroform extract has also yielded two saponins (m.p.s. 120 degree and 170 degree C). The structures of the isolated compounds were discussed. (Abstr. No. TO-5).

9204-2372 Ahmad, V.U., Iqbal, S. (H.E.J. Research Institute of Chemistry, University of Karachi, Karachi 75270, Pakistan) **Cohirsitinine, a new isoquinoline alkaloid from *Cocculus hirsutus*.** *Journal of Natural Products*, v. 55(2): p. 237-240, 1992 (16 ref, Eng).

A new isoquinoline alkaloids, cohirsitinine (C18H23NO3) has been isolated from whole plant of *C. hirsutus*. Its structure has been assigned on the basis of spectral studies. Its relative stereochemistry has been determined by homonuclear 2D 1H-NMR (COSY-45, J-resolved, NOESY) and nOe different measurements.

9204-2373 Ahmad, V.U., Ghazala, Uddin, S. (H.E.J. Research Institute of Chemistry, University of Karachi, Karachi 75270, Pakistan) **A triterpenoid saponin from *Zygophyllum propinquum*.** *Phytochemistry*, v. 31(3): p. 1051-1054, 1992 (18 ref, Eng).

A new triterpenoid saponin, 3-O-(alpha-L-arabinopyranosyl (1-2)-beta-D-quinovopyranosyl)-quinovic acid-27-O-beta-(beta-D-glucopyranosyl) ester, along with two known compounds, 3-O-(beta-D-

glucopyranosyl)-beta-sitosterol and erythrodiol-3-caffeoate have been isolated from *Z. propinquum* and identified on the basis of spectroscopic and chemical evidence.

9204-2374 Ahmad, V.U. (H.E.J. Research Institute of Chemistry, University of Karachi, Karachi 75270, Pakistan) **New saponins from medicinal plants of Pakistan.** *7th Asian Symposium on Med. Plants, Spices and Other Natural Prod. (ASOMPS VII). Manila, 2-7 February 1992 (Eng).*

Some new saponins have been isolated from medicinal plants of Pakistan e.g. *Guaiacum officinale* (G), *Zygophyllum propinquum* (Z), *Castanospermum australe* (C) and *Sympytum officinalis* (S). Methanol extract of G was active against gram positive bacteria. Aqueous and ethanol extract of Z showed antibacterial activity against gram positive bacteria; the plant also lowers blood pressure and shows antihistamine activity. Leaves of C show strong antioxidant activity, CNS depresant and analgesic activity. Ethanol extract of S showed antibacterial activity. (Abstr. No. TO-3).

9204-2375 Ai, C.B., Li, L.N.* (Institute of Materia Medica, Chinese Academy of Medical Sciences, Beijing 100050, People's Republic of China) **Salvianolic acids D and E: Two new depsides from *Salvia miltiorrhiza*.** *Planta Medica*, v. 58(2): p. 197-199, 1992 (6 ref, Eng).

Four water-soluble constituents, salvianolic acids D, E, ethyl lithospermate, and isoferulic acid were isolated from *S. miltiorrhiza*. Salvianolic acid D and E are new depsides. Their chemical structures were determined by chemical and spectral analysis. The structure of salvianolic acid D was finally confirmed by comparison with a synthetic product.

9204-2376 Akgul, A. (Food Science Department, Faculty of Agriculture, Selcuk University, 42049 Konya, Turkey) **The essential oil composition of Turkish Laser trilobum (L.) Borkh. fruits.** *Journal of Essential Oil Research*, v. 4(1): p. 89-90, 1992 (3 ref, Eng).

The chemical composition of the fruit essential oil of *L. trilobum* was determined by capillary GC and GC/MS. Among the twenty two components identified, limonene (60.70 percent) and perillaldehyde (32.30 percent) were found to be the major constituents.

9204-2377 Al-Said, M.S., Khalifa, A.S., Al-Azizi, M.M. (Department of Pharmacognosy, College of Pharmacy, King Saud University, Riyadh 11451, Saudi Arabia) **Flavonoids from *Cissus digitata*.** *International Journal of Pharmacognosy*, v. 29(4): p. 281-283, 1991 (11 ref, Eng).

The isolation of apigenin, luteolin and ampelopsin (3,3',4',5,5',7-hexahydroxyflavanone) from the aerial parts of *C.digitata* is reported.

9204-2378 Al-Yahya, M.A., El-Domiati, M.M. , Al-Meshal, I.A., Al-Said, M.S., El-Ferly, F.S.(Department of Pharmacognosy and Medicinal, Aromatic and Poisonous Plants Research Center, College of Pharmacy, King Saud University, P.O.Box 2457, Riyadh 11451, Saudi Arabia) **(+)-Dihydroperfamine: an alkaloid from *Haplophyllum tuberculatum*.** *International Journal of Pharmacognosy*, v. 29(4): p. 268-272, 1991 (16 ref, Eng).

The structure of dihydroperfamine (C₁₈ H₂₁ NO₄; mp. 160-61 degree), partially enriched by its dextrorotatory enantiomer, isolated from a Saudi Arabian variant *H.tuberculatum* was deduced from its physical and spectral data, and by direct comparison with the (-)-antipode. The profile of the other isolated constituents, justicidin A, justicidin B, 3-dimethylallyl-4-dimethylallyloxy-2-quinolone and (+)-tuberine has been compared to those reported in other variants.

9204-2379 Alarcon, E.J., Becerra, J., Silva, M., Jakupovic, J., Tsichritzis, F.(Faculty de Recursos Naturales, U.de Bío-Bío, Chillan, Chile) **B-Agarofuran sesquiterpene esters from *Maytenus disticha*.** *Revisita Latinoamericana de Quimica*, v. 22(3): p. 65-66 , 1991 (8 ref, Eng).

Four sesquiterpene polyesters of eudesmane type have been isolated from the aerial parts of *M.disticha* and identified.

9204-2380 Aliotta, G., De Napoli, L. , Giordano, F., Piccialli, G. , Piccialli, V., Santacroce, C.(Dipartimento di Biologia Vegetale, Universita'di Napoli, Via Foria 223, I-80139 Napoli, Italy) **An oleanane triterpene from *Anagallis arvensis*.** *Phytochemistry*, v. 31(3): p. 929-933, 1992 (16 ref, Eng).

A new triterpene metabolite with an oleanane skeleton, has been isolated from *A.arvensis* and its structure established on the basis of spectral analyses (including ¹H-¹H and ¹H-¹³C COSY), performed both on the original compound and its acid-catalysed hydrolysis product. A single crystal X-ray diffraction analysis performed on the p-iodobenzoate derivative enabled the assignment of the absolute configuration.

9204-2381 Alkhathlan, H.Z., Al-Zoman, M.M. , Basha, R.M., Mousa, A.A., Al-Hazimi, H.M.G.(Department of Chemistry, King Saud University, Riyadh 11451, Saudi Arabia) **Essential oils of some Saudi Pulicaria and Artemisia species.** *Oriental Journal of Chemistry*, v. 7(4): p. 204-209 , 1991 (20 ref, Eng).

The constituents of the essential oils of two *Pulicaria* species are reported here for the first time. In addition, the oils of a *Pulicaria* and five *Artemisia* species have been analysed and compared with previous studies.

9204-2382 Anderson, J.E., Ma, W., Smith, D.L. , Chang, C.J., McLaughlin, J.L.* (Department of Medicinal Chemistry and Pharmacognosy, School of Pharmacy and Pharmacal Sciences, Purdue University, West Lafayette, Indiana 47907) **Biologically active gamma-lactones and methylketoalkenes from *Lindera benzoin*.** *Journal of Natural Products*, v. 55(1): p. 71-83, 1992 (36 ref, Eng).

Brine shrimp lethality-directed fractionation of the 95 percent EtOH extract of ripe berries from *Lindera benzoin* led to the isolation of three new C₂₁ alkane-alkene gamma-lactones designated isolinderanolide, isolinerenolide and linderanolide as well as the known series of C₁₇ and C₁₉ obtusilactones (isoobtusilactone A, obtusilactone A, isoobtusilactone and obtusilactone previously isolated from *Lindera obtusiloba*. The novel (6Z,9Z,12Z)-pentadecatrien-2-one, the known (6Z,9Z)-pentadecadien-2-one, and the known (+)-(Z)-nerolidol were also isolated as bioactive compounds. The structural elucidation and biological activities of these compounds are reported.

9204-2383 Arbain, D.(Department of Pharmacy FMIPA Universitas Andalas Kampus Limau Manis, PO Box 143 Padang, Indonesia) **Chemical study of some west Sumatran plants.** *7th Asian Symposium on Med. Plants, Spices, and Other Natural Prod. (ASOMPS VII)*. Manila, 2-7 February 1992 (Eng).

In the study of the chemistry of Sumatran plants, more than one thousand plants have been collected and tested for their secondary metabolites especially alkaloids. Some alkaloid bearing plants having traditional medicinal value have been selected for chemical study. Some Euphorbiaceus plants : *Sapium baccatum*, *Margaritaria indica* and *Antidesma tetranda* contained new alkaloids. (Abstr.No. TO-2).

9204-2384 Asari, F., Kusumi, T., Zheng, G.Z. , Cen, Y.Z., Kakisawa, H.* (Department of Chemistry, University of Tsukuba, Tsukuba, Ibaraki 305, Japan) **Cryptoacetalide and epicryptoacetalide, novel spirolactone diterpenoids from *Salvia miltiorrhiza*.** *Chemistry Letters*, v. No.10 : p. 1885-1888, 1990 (4 ref, Eng).

Two novel spirolactone diterpenoids have been isolated from the roots of Chinese medicinal plants, *S.miltiorrhiza*. Their structures were established by spectroscopic means including 2D-NMR methods. JICST, Tokyo.

9204-2385 Asibal, C.F., Zalkow, L.H.(Chemistry Department, Mindanao State University, Marawi City, Phil. USA)

Pyrrolizidine alkaloids: Studies in isolation, structure elucidation and biological activity. *7th Asian Symposium on Med. Plants, Spices, and Other Natural Prod. (ASOMPS VII). Manila, 2-7 February 1992* (3 ref, Eng).

Eleven 12-membered macrocyclic pyrrolizidine alkaloids based either on retronecine or otonecine were obtained from *Senecio anomalous*. From the Middle Eastern plants *Cynoglossum creticum*, *Heliotropium arbainense* and *H. rotundifolium*, nine mono and diesters of heliotridine were isolated. Five of these alkaloids were isolated for the first time. Structure elucidation was obtained by spectral methods (1H and 13C NMR, COSY, HETCOR, ir, hrms), X-ray crystallography, degradation reactions and semisynthesis. *In vitro* anti-cancer screening of the alkaloids has been reported. (Abstr. No. MO-4).

9204-2386 Baba, K., Kawanishi, H., Taniguchi, M., Kozawa, M.* (Osaka University of Pharmaceutical Sciences, 2-10-65 Kawai, Matsubara-City, Osaka 580, Japan) **Chromones from Cnidium monnieri.** *Phytochemistry*, v. 31(4): p. 1367-1370, 1992 (4 ref, Eng).

Four new chromones, cnidimol C-F, along with cnidimol A, cnidimol B and karenin were isolated from the aerial parts of *C. monnieri* and their structures elucidated.

9204-2387 Baek, N.I., Kim, H., Lee, Y.H., Kang, K.S., Kim, S.I. (Laboratory of Natural Products, Korea Ginseng & Tobacco Research Institute, Science Town, Yusung PO Box 7, Daejon 305345, Korea) **A new dehydrodieugenol & antioxidant material from Magnolia officinalis.** *7th Asian Symposium on Med. Plants, Spices and Other Natural Products (ASOMPS VII). Manila, 2-7 February 1992* (Eng).

The bark of *M. officinalis* has afforded magnolol, eugenol and other viz. O-methyleugenol(1), 5,5'-di-2-propenyl-3,2',3'-trimethoxy-1,1'-diphenyl-2-ol(2) and 4,4'-di-2-propenyl-3,2',6'-trimethoxy-1,1'-diphenyl ether (3). Examination of antioxidant activity for 1,2 and 3 by thiobarbituric acid (TBA) assay showed that 2 was almost equivalent to BHT or BHA in the activity. (Abstr. No. TP-2).

9204-2388 Baltaev, U.A. (Institute of the Chemistry of Plant Substances Academy of Sciences of the Uzbek SSR Tashkent, USSR) **Isolation, structure and biological activity of Central Asia vegetable flora phytoecdysteroids.** *7th Asian Symposium on Med. Plants, Spices and Other Natural Prod. (ASOMPS VII). Manila, 2-7 February 1992* (Eng).

Plants of Compositae family; namely: *Rhaponticum integrifolium*, *R. carthamoides*, *R. luratum*, *R. nanum* and of Caryophyllaceae family, namely: *Silene nutans*, *S. tatarica* and *Lychnis fulgens* were investigated on the content of phytoecdysteroids. Fifteen compounds were isolated. Structure of the new compounds were revealed by methods of

spectral analysis and chemical transformations. Some phytoecdysteroids were studied on anti-ulcer, protein synthesizing and other activities. (Abstr. No. TP-10).

9204-2389 Baltaev, U.A. (Institute of the Chemistry of Plant, Substances, Academy of Sciences of the Uzbek SSR Tashkent, USSR) **The new phytoecdysteroids of rhaboticum carthamoides seeds.** *7th Asian Symposium on Med. Plants, Spices, and Other Natural Prod. (ASOMPS VII). Manila, 2-7 February 1992* (Eng).

Methanol extract of the air dried seeds afforded on chromatography two known ecdysteroids, viz., ecdysterol, 2-desoxyecdysterol, 24(28)-dehydromakisterol A, and 20,22-monoacetonide of ecdysterol, as well as three new ecdysteroids named rabisreons. (Abstr. No. WO-7).

9204-2390 Basnet, P., Pant, R.K., Prasain, J., Manandhar, K., Manandhar, M.D. (Central Department of Chemistry, Tribhuvan University, Kirtipur, Kathmandu, Nepal) **Chemical constituents of Euonymus species.** *7th Asian Symposium on Med. Plants, Spices and Other Natural Prod. (ASOMPS VII). Manila, 2-7 February 1992* (2 ref, Eng).

Isolation and characterization of chemical constituents from some *Euonymus* species of Nepal has been presented. The results of the phytochemical and biological screening of the plant extracts were discussed. (Abstr. No. MP-3).

9204-2391 Bastida, J., Codina, C.*, Viladomat, F., Rubiralta, M., Quirion, J.C., Weniger, B. (Departament de Productes Naturals, Facultat de Farmacia, Universitat de Barcelona, 08028, Barcelona, Catalonia, Spain) **Narcissus alkaloids, XIV. 1 (+)-8-O-acetylhomolycorine and vasconine, two novel alkaloids from Narcissus vasconicus.** *Journal of Natural Products*, v. 55(1): p. 122-125, 1992 (12 ref, Eng).

From the MeOH extract of the whole plants of *Narcissus vasconicus*, two previously unreported alkaloids, (+)-8-O-acetylhomolycorine and vasconine have been isolated. The well-known alkaloids (-)-lycorine and (+)-homolycorine were also present.

9204-2392 Bastida, J., Codina, C., Viladomat, F., Rubiralta, M., Quirion, J.C., Weniger, B. (Departament de Productes Naturals, Facultat de Farmacia, Universitat de Barcelona, 08028, Barcelona, Catalonia, Spain) **Narcissus alkaloids, XV. Roserine from Narcissus pallidulus.** *Journal of Natural Products*, v. 55(1): p. 134-136, 1992 (5 ref, Eng).

The MeOH extract of *N. pallidulus* afforded, a novel compound roserine (1). The structure of 1 was elucidated by spectroscopic methods, including 2D NMR analyses.

9204-2393 Bentley, M.D., Gaul, F., Rajab, M.S., Hassanali, A. (Department of Chemistry, University of Maine, Orono, Maine 04469) **Tetranortriterpenes from *Turraea robusta*.** *Journal of Natural Products*, v. 55(1): p. 84-87, 1992 (12 ref, Eng).

A new limonoid, mzikonol, in addition to the known limonoids mzikonone, azadirone, 1,2-dihydroazadirone, and nimbolinin B, was isolated from the root bark of *T.robusta*. In addition, a new tetranortriterpene lactone, turranolide, and the known triterpene, butyrospermol, both possible protolimonoids, were isolated. Compounds were identified by chemical and spectroscopic methods.

9204-2394 Bin Din, L., Samsudin, M.W. (University Kebangsaan Malaysia, Malaysia) **Essential oil content of three species of ginger.** *Zingiberaceae Workshop, Prince Songkla University, Hat Yai, Thailand*, p. 10, 15-18 Oct. 1991 (Eng).

Essential oil contents of three gingers, *Zingiber officinale*, *Alpinia galanga* and *Kaempferia galanga* were studied. All species showed similarities in their monoterpene contents. Neral and geranial were present in *Z.officinale* and absent in *A.galanga* and *K.galanga* methyleugenol and caryophyllene were present in *A.galanga* but absent in the other two species. The presence of cinnamic acid derivatives such as ethyl cinnamate and ethyl p-methoxycinnamate in *K.galanga* was prominent..

9204-2395 Bloor, S.J. (DSIR Chemistry, Private Bag, Petone, New Zealand) **Antiviral phloroglucinols from New Zealand Kunzea species.** *Journal of Natural Products*, v. 55(1): p. 43-47, 1992 (11 ref, Eng).

Four acyl-phloroglucinol derivatives showing antiviral activity have been isolated from *Kunzea sinclairii* and *K.ericooides* from New Zealand. The structures of these compounds were deduced from analysis of spectral data. Two of these compounds are the isomers of isobutyryl methoxyresorcinol. The two new compounds were isolated as a mixture and determined to be 4-cyclohexene-1,3-dioxo-5-hydroxy-2,2,6,6-tetramethyl-4-(1-(2,6-dihydroxy-4-methoxy-3-(3-methyl-1-oxobutyl)phenyl)-3-methylbutyl) and its 2-methyl-1-oxopropyl analogue, respectively.

9204-2396 Boll, P.M., Hald, M., Parmar, V.S.* , Tyagi, O.D., Bisht, K.S., Sharma, N.K.* , Hansen, S. (Department of Chemistry, Odense University, DK 5230 Odense M, Denmark) **A wax ester from *Piper clarkii*.** *Phytochemistry*, v. 31(3): p. 1035-1037, 1992 (6 ref, Eng).

A novel type of wax ester has been isolated from a petrol extract of stems and leaves of *Piper clarkii* and its structure established as 3-(4-hydroxyphenyl)_propyl

tetracosanoate. The structure was verified by synthesis. The oxygenated cyclohexane (+)-crotepoxide and beta-sitosterol were also isolated.

9204-2397 Bolzani, V.da S., Trevisan, L.M.V. , Young, M.C.M. (Instituto de Quimica, Universidade Estadual Paulista, CP 355, 14800 Araraquara, SP, Brazil) **Triterpenes of *Palicourea rigida* HBK.** *Revista Latinoamericana de Quimica*, v. 22(4)+23(1): p. 20-21, 1992 (17 ref, Eng).

Friedelin, 3beta-hydroxyfriedelane, 30-hydroxyfriedelan-3-one, alpha- and beta-amyrin, lupeol, stigamsterol and beta-sitosterol-3beta-D-glucoside, have been isolated from the leaves of *P.rigida*.

9204-2398 Brophy, J.J., Lassak, E.V., Boland, D.J. (Department of Organic Chemistry, University of New South Wales P.O.Box 1, Kensington NSW 2033, Australia) **The leaf essential oils of *Eucalyptus nova-anglica* Deane & Maiden.** *Journal of Essential Oil Research*, v. 4(1): p. 29-32 , 1992 (10 ref, Eng).

Analysis of the essential oils obtained by steam distillation of the leaves of *E.nova-anglica* Deane & Maiden by GC/MS reveals that this species exists in three chemotypic forms, all of which are characterized by the presence of large amounts of sesquiterpenes. Chemotype 1 contains large amounts of alpha, beta-and gamma-eudesmol, chemotype 2 upto 80 percent nerolidol while chemotype 3 contains large amounts of aromadendrene and the related alcohol, globulol.

9204-2399 Calis, I., Ersoz, T., Chulia, A.J. , Ruedi, P. (Department of Pharmacognosy, Hacettepe University, Faculty of Pharmacy, TR-06100 Ankara, Turkey) **Septemfidoside: A new bis-iridoid diglucoside from *Gentiana septemfida*.** *Journal of Natural Products*, v. 55(3): p. 385-388 , 1992 (12 ref, Eng).

From the MeOH extract of the aerial parts of *G.septemfida* a new bisiridoid diglucoside, septemfidoside, was isolated along with eight known glucosides, gelidoside, sweroside, gentiopicroside, swertiamarin, eustomoside, eustomorusside, eustoside, and loganic acid. Their structures were established by spectral studies.

9204-2400 Chakrabarty, M., Nath, A.C. (Department of Chemistry, Bose Institute, 9311, A.P.C.Road, Calcutta 700 009, India) **New clerodane-type butenolide diterpene from the bark of *Polyalthia longifolia*.** *Journal of Natural Products*, v. 55(2): p. 256-258 , 1992 (13 ref, Eng).

A new gamma methoxybutenolide clerodane diterpene has been isolated from the petroleum ether extract of the bark of *P.longifolia*. Its structure has been deduced by

spectral analyses and by chemical correlation with the corresponding gamma hydroxybutenolide diterpene isolated earlier from this plant.

9204-2401 Charles, D.J., Simon, J.E., Singh, N.K.(Department of Horticulture, Purdue University, West Lafayette, IN 47907, USA) **The essential oil of Alpinia galanga Willd.** *Journal of Essential Oil Research*, v. 4(1): p. 81-82, 1992 (5 ref, Eng).

Twelve compounds have been characterized by GC and GC/MS in oil obtained from the rhizome and leaves of *A. galanga*. The major compounds is myrcene, 94.51 percent, rhizome; 52.34 percent leaves.

9204-2402 Chaudhuri, P.K.(Central Institute of Medicinal and Aromatic Plants, P.O.RSM, Nagar, Lucknow 226016, UP, India) **7-Hydroxyechinozolinone, a new alkaloids from the flowers of Echinops echinatus.** *Journal of Natural Products*, v. 55(2): p. 249-250, 1992 (6 ref, Eng).

A new minor alkaloid (C₁₀H₁₀N₂O₃) from the flowers of *E. echinatus* has been identified as 7-hydroxy-3-(2-hydroxyethyl)-(3H)-quinazolin-4-one and named 7-hydroxyechinozolinone.

9204-2403 Che, C., Amarquaye, A., Bejar, E., Fong, H.H.S., Malone, M.H.(Chemistry Department, The Hong Kong University of Science and Technology, Hong Kong) **Chemical and Biological studies on Byrsonima crassifolia.** *7th Asian Symposium on Med. Plants, Spices, and Other Natural Prod. (ASOMPSVII)*. Manila, 2-7 Fedbruary 1992 (Eng).

A MeOH extract of *B. crassifolia* leaves was fractionated and studied for spasmogenic effect by using isolated rat fundus. A total of 16 secondary metabolites were subsequently isolated by repeated chromatography and tested for biological activity. These compounds included benzenoids, flavonoids, triterpenes, steroids and pipecolic acid derivatives. Chemical structures were determined. Detailed spectral properties of the new compounds and bioassay results were presented. (Abstr.No. WO-3).

9204-2404 Cheetham, N.W.H., Cheung, P.C.K., Evans, A.J.(School of Chemistry, University of New South Wales, Sydney, Australia) **Studies on polysaccharides from lupin kernels.** *7th Asian Symposium on Med. Plants, Spices and Other Natural Prod. (ASOMPS VII)*. Manila, 2-7 February 1992 (Eng).

The structure of polysaccharides extracted from the kernels of seeds from *Lupin angustifolius* were characterised with the aid of specific enzymic hydrolysis, methylation analysis, HPLC and high-field NMR spectroscopy. (Abstr. No. WO-4).

9204-2405 Chen, K., Shi, Q., Fujioka, T., Zhang, D.C., Hu, C.Q., Jin, J.Q., Kilkuskie, R.E., Lee, K.H.(Natural Products Laboratory, Division of Medicinal Chemistry and Natural Products, School of Pharmacy, University of North Carolina, Chapel Hill, North Carolina 27599) **Anti-aids agents, 4. 1 tripterifordin , a novel anti-HIV principle from Tripterygium wilfordii: Isolation and structural elucidation.** *Journal of Natural Products*, v. 55(2): p. 88-92, 1992 (5 ref, Eng).

A new kaurane-type diterpene lactone, tripterifordin (1), has been isolated from the roots of *T. wilfordii*. The structure of 1 was elucidated by spectroscopic methods, including the concerted application of a number of 2D nmr technique that involved the 1H-1H COSY, heteronucleus-detected variants of the heteronuclear chemical shift correlation (HETCOR), phase-sensitive NOESY, and long-range HETCOR. Compound 1 shows anti-HIV replication activity in H9 lymphocyte cells with an EC₅₀ of 1 micro/ml/..

9204-2406 Chen, Z.S., Lai, J.S., Kuo, Y.H.(Department of Applied Chemistry, Chia-Nan College of Pharmacy, Tainan, Taiwan, ROC) **Cynanformosides A and B two new pregnane glycosides, from the aerial part of Cynanchum formosanum.** *Chemical & Pharmaceutical Bulletin*, v. 39(11): p. 3034-3036, 1991 (5 ref, Eng).

Two new pregnane glycosides, cynanformosides A and B, together with alpha-amyrin acetate, taraxerol, chrysoeriol, and isorhamnetin were isolated from the aerial part of *C. formosanum*. The structures of the new pregnane glycosides have been elucidated by spectroscopic and chemical methods.

9204-2407 Cheng, D.L., Cao, X.P.(Department of Chemistry, National Laboratory of Applied Organic Chemistry, Lanzhou University, Lanzhou, Gansu 730000, People's Republic of China) **Pomolic acid derivatives from the root of Sanguisorba officinalis.** *Phytochemistry*, v. 31(4): p. 1317-1320, 1992 (13 ref, Eng).

Two new natural derivatives of pomolic acid, 3,11-dioxo-19alpha-hydroxyurs-12-en-28-oic acid and 28-O-beta-D-glucopyranosyl-pomolic acid ester, have been isolated from the roots of *S. officinalis*.

9204-2408 Chiu, M., Nie, R., Li, Z., Zhou, J.(Laboratory of Phytochemistry, Kunming Institute of Botany, Academia Sinica, Kunming 650204, People's Republic of China) **Four new steroidal alkaloids from Pachysandra axillaris.** *Journal of Natural Products*, v. 55(1): p. 25-28, 1992 (7 ref, Eng).

The chemical structures of four new steroidal alkaloids, axillarines C,D,E and F, from *P. axillaris* were

elucidated as 20alpha-dimethylamino-3-beta-benzoylamino-2-beta-hydroxy-5alpha-pregna n-4beta-yl acetate, 20alpha-dimethylamino-3beta-benzoyl-amino -5alpha-pregnane-2beta, 4beta-diol diacetate, 20alpha-dimethylamino-3beta-benzoylamino-5alpha-pregnane-2beta, 4beta-diol, and 20alpha-dimethylamino-3beta-tigloylamino-2beta-hydroxy-5alpha-pregn-4beta-yl acetate respectively.

9204-2409 Choudhary, M.I., Atta-ur-Rahman(H.E.J. Research Institute of Chemistry, University of Karachi, Karachi-75270, Pakistan) **Novel bioactive natural products from indigenous medicinal plants of Pakistan, Sri Lanaka and Turkey.** *7th Asian Symposium on Med. Plants, Spices, and Other Natural Prod. (ASOMPS VII).* Manila, 2-7 February 1992 (Eng).

Phytochemical studies on *Nigella sativa*, *Rhazya stricta*, *Cocculus pendulus*, *Trachelospermum jasminoides*, *Catharanthus roseus*, *Tinospora malabarica*, *Buxus papilosa*, *Buxus sempervirens*, *Sophora griffitii*, *Withania coagulans*, *Withania somnifera*, *Sida pakanica*, *Sida ovata*, *Buxus longifolia*, *Buxus helderbrandii*, *Murraya paniculata*, *Petchia ceylanica* and several *Berberis* species has recently led to the isolation and structure elucidation of a host of new natural products. Structural studies on several new and novel compounds have been carried out (Abstr.No. WO-27).

9204-2410 Collins, D.J., Pilotti, C.A. , Wallis, A.F.A.(Department of Chemistry, Monash University, Clayton, Victoria 3168, Australia) **Triterpene acids from some Papua New Guinea Terminalia species.** *Phytochemistry*, v. 31(3): p. 881-884, 1992 (21 ref, Eng).

The trihydroxylated triterpene acids arjunolic acid and asiatic acid were found in ether extracts of the woods of *Terminalia brassii* and of *T.complanata*. Asiatic acid has not previously been reported as a constituent of the genus *Terminalia*. A similar extract of *T.impediens* yielded the tetrahydroxy acid terminolic acid as the major constituent; this acid was also detected as a minor constituent of *T.complanata*. Terminolic acid, however, does not occur in glycosidic combination in *Centella asiatica*, as has been recently reported.

9204-2411 Cordell, G.A., Pezzuto, J.M., Lin, L.Z., Lin, L.J., Shieh, H.L., Mar, W. , Likhitwitayawuid, C.K., Angerhofer, D.C. , Lankin, L., Xue, L. et al(Department of Medicinal Chemistry and Pharmacognosy, College of Pharmacy, University of Illinois at Chicago, Chicago, Illinois, 60612, USA) **Anticancer and antimalarial agents from plants.** *7th Asian Symposium on Med. Plants, Spices, and Other Natural Prod. (ASOMPS VII).* Manila, 2-7 February 1992 (Eng).

Some recent studies on the isolation and structure elucidation of new plant anticaner and antimalarial agents were described viz., the valepotriates from *Valerian officinalis*, a novel diterpene from *Salvia microstegia*, a bisamide from *Aglaia pyramidata*, a group of macrocyclic alkaloids from *Albizia amara* isolated by a new DNA-binding assay, and two series of bisbenzyliso-quinolines from *Cyclea barbata* and *Stephania erecta*. Important in the structure elucidation of these alkaloids and terpene derivatives was the selective INEPT nmr technique, as well as a broad range of one- and two-dimensional nmr techniques. Some studies with the FLOCK heteronuclear correlation sequence were also described. (Abstr.No. TO-11).

9204-2412 Cravo, L., Perineau, F., Delmas, M., Bessiere, J.M. (Laboratoire de Chimie des Agroressources ENSCT, 118 route de Narbonne, 31077 Toulouse Cedex, France) **Volatile of the fruit of *Dacryodes buettneri* H.J.Lam and *D.igaganga* Aubrev. et Pellegr. (Burseraceae).** *Journal of Essential Oil Research*, v. 4(1): p. 95-96 , 1992 (4 ref, Eng).

The volatile concentrates of the fruit of *D.buettneri* and *D.igaganga* have been examined by GC/MS. The major volatile components of *D.buettneri* were alpha-pinene 29.2 percent and limonene 24.3 percent, whereas, *D.igaganga* yielded alpha-copaene, 15.5 percent and alpha-humulene, 13.8 percent.

9204-2413 Cui, J.F., Niu, C.Q., Zhang, J.S..(Institute of Materia Medica, Chinese Academy of Medical Sciences, Beijing 100050) **Determination of six Ephedra alkaloids in Chinese Ephedra (Ma Huang) by gas chromatography.** *Acta Pharmaceutica Sinica*, v. 26(11): p. 852-857 , 1991 (5 ref, Eng, Jap).

Six *Ephedra* alkaloids, namely ephedrine, pseudoephedrine, norephedrine, norpseudoephedrine, methylephedrine and methylpseudoephedrine, in 12 species of Chinese *Ephedra* were separated and determined by gas chromatography with the highly specific and sensitive nitrogen phosphorus detector (GC/NPD). The column used (HP-5) had a cross linked 5 percent phenylmethylsilicone phase. Diphenylamine was used as the internal standard to check the reproducibility of the extraction yields of the alkaloids, the stability of the detector response and to quantify the alkaloids. The contents of the six alkaloids were calculated according to their regression equations. The way for the preparation of crude drug samples was improved, the diethyl ether extract of the alkalized crude sample was directly analysed by GC.

9204-2414 Dang, H.T., Dam, T.B., Tran, T.A.(Faculty of Pharmacy 13 Le Thanh Tong, HANOI, Vietnam) **Study of selenium rich plants used in traditional medicine in Vietnam.** *7th Asian Symposium on Med. Plants, Spices, and*

Other Natural Prod. (ASOMPS VII). Manila, 2-7 February 1992 (Eng).

In Vietnam, the studies of selenium rich plants has been carried out for a long time. Some plants used in Vietnamese traditional medicine containing selenium have been identified viz., *Mimosa pudica*, *Leucanena glauca*, *Morinda citrifolia*, *M.officinalis*. Among these plants, *M.pudica* is rich in selenium. Chemical investigation of the selenium content of different parts of plant *M.pudica*, collected from different geographical regions, and in different weathers has been done. Pharmacological action of the plant has also been studied. (Abstr. No. MO-13).

9204-2415 Darise, M.. Studies on chemical constituents of some Indonesian medicinal plants. 7th Asian Symposium on Med. Plants, Spices and Other Natural Prod.(ASOMPS VII). Manila, 2-7 February 1992 (3 ref, Eng).

Isolation and structures determination of lupeol from *Trevia nudiflora* and a steroid from *Gynostemma pedatum* was determined by spectroscopic analysis and chemical evidences. (Abstr. No. WP-10).

9204-2416 Dayal, R., Dobhal, P.C.(Minor Forest Products Division, Forest Research Institute, Dehra Dun-248006, UP, India) Chemical constituents of Eucalyptus hybrid. Journal of The Indian Chemical Society, v. 68(8): p. 478-479, 1991 (7 ref, Eng).

Air dried leaves of Eucalyptus hybrid (Mysore gum; mainly *Eucalyptus tereticornis*) yielded gallic acid, 2,7-beta-D-glucosyloxy-5-hydroxy-2-methyl chromone, beta-sitosterol and catechin.

9204-2417 Dayrit, F.M., Lagurin, L.G.(Philippine Institute of Pure and Applied Chemistry Ateneo de Manila University, Loyola Heights, Q.C., Philippines) Phytochemical studies on the leaves of Vitex negundo, L. Identification of bronchial relaxing constituents. 7th Asian Symposium on Med. Plants, Spices, and Other Natural Prod.(ASOMPS VII). Manila, 2-7 February 1992 (Eng).

V.negundo (lagundi) is a well established medicinal plant used for cough relief. Bioassay of the solvent extracts showed that nine active compounds could be found in the EtOAc and MeOH extracts. Of these, 2 are aromatic acids (hydroxy benzoic acids), 2 are flavonoids (isoorientin and luteolin-7-O-glucoside), 2 are glycosylated aromatic acids, 1 is an iridoid. Two bioassay methods were used to test the in-vitro inhibition of histamine release using rat mast cells, and an isolated tissue procedure involving the relaxation of cat's trachea. (Abstr. No. To-15).

9204-2418 de Diaz, A.M.P., Diaz, P.P.(Departamento de Quimica, Facultad de Ciencias Universidad Nacional de Colombia, Bogota, Colombia) C6-C3 and C6-C1 metabolites from essential oil of the wood bark of Ocotea caparrapi. Revista Latinoamericana de Quimica, nv. 22(3): p. 60-62 , 1991 (12 ref, Eng).

Elemicin, mysristicin, O-methyl eugenol, trans-4-dimethoxycinnamaldehyde, trans-3,4,5-trimethoxy-cinnamaldehyde, trans-3-methoxy-4,5-methylenedioxycinnamaldehyde and 3,4-dimethoxybenzaldehyde have been isolated from the essential oil of *O.caparrapi* and identified.

9204-2419 Deng, J.Z., Zhao, S.X., Miao, Z.C.(Department of Phytochemistry, China Pharmaceutical University, Nanjing, Jiangsu 210009, PR, China) Morphinane alkaloid from roots of *Stephania cepharantha*. Phytochemistry, v. 31(4): p. 1448-1450, 1992 (6 ref, Eng).

From the roots of *S.cepharantha*, a new morphinane alkaloid, named cephamorphinanine, was isolated along with seven known alkaloids including one aporphine, two morphinananes, one promorphinanane and three bisbenzylisoquinolines. The structure of cephamorphinanine was established from spectral analysis and chemical correlation.

9204-2420 Desh Deepak, Ruchi Chandra, Khare, A.(Khare's School of Natural Products, Department of Chemistry, Lucknow University, Lucknow 226007, India) Structure of hemidesine. 7th Asian Symposium on Med. Plants, Spices and Other Natural Prod.(ASOMPS VII). Manila, 2-7 February 1992 (Eng).

In the search for pregnane glycosides as anticancer and antitumour agents from Asclepiadaceae plants, a new pregnane glycoside hemidesine was isolated from chloroform and chloroform alcohol 4:1 extracts of *Hemidesmus indicus*. On the basis of chemical and spectral data (NMR, Mass), the structure of hemidesmine, a diglycoside (C36H58O11, mp 148 degree C) was confirmed as (20-O-acetyl calogenin 3-O-beta-D oleandropyranosyl (1 to 4) O-beta-D-digitoxopyranoside.

9204-2421 Desh Deepak, Ruchi Chandra, Khare, A.(Khare's School of Natural Products, Department of Chemistry, Lucknow University, Lucknow 226007, India) Structure of emidine. 7th Asian Symposium on Med. Plants, Spices and Other Natural Prod.(ASOMPS VII). Manila, 2-7 February 1992 (Eng).

In the course of isolation of pregnane glycosides as antitumour and anticancer agents from Asclepiadaceae plants, a novel pregnane triglycoside named emidine (C39H64O12, mp 192-96 degrees C) was isolated from the chloroform and chloroform-alcohol 4:1 extracts of *Hemidesmus indicus*. On the basis of chemical and spectral

data the structure of emidine was confirmed as calogenin-3-O-beta-D, digitoxopyranosyl (1 to 4) O-beta-D-digitoxopyranosyl (1 to 4)-O-beta-D-digitoxopyranoside. (Abstr. No. TO-6).

9204-2422 Dhasmana, H., Garg, H.S. (Medicinal Chemistry Division, Central Drug Research Institute, Lucknow 226001, UP, India) **Lepidoside- A rare flavonol diglycoside from *Crotalaria semperflorens* Vent..** *Journal of the Indian Chemical Society*, v. 68(10): p. 476-477, 1991 (9 ref, Eng).

Isolation and characterisation of rare flavonol lepidoside along with kaempferitrin, kaemferol and crosemperine have been reported.

9204-2423 Ding, Y.L., Jia, Z.J.* (Institute of Organic Chemistry, Lanzhou University, Lanzhou 730000, China) **Two phenolic derivatives from *Euphorbia kansui*.** *Phytochemistry*, v. 31(4): p. 1435-1436, 1992 (7 ref, Eng).

From the acetone extract of the roots of *E.kansui*, two new phenolics were identified as 1,1-bis(2,6-dihydroxy-3-acetyl-4-methoxyphenyl)methane and methyl (2,4-dihydroxy-3-formyl-6-methoxyphenyl ketone. Five known compounds were characterized: 24-methylenecycloartenol, beta-amyrin acetate, sitosterol, sitosterol glucoside and sucrose.

9204-2424 Djarmati, Z., Jankov, R.M. , Djordjevic, A., Ribar, B., Lazar, D. , Engel, P. (Technical High School and Institute of Technology "Servo Mihajl", 23000 Zrenjanin, P.Drapsina 15, Yugoslavia) **Carnosic acid 12-methyl ether-gamma-lactone, a ferruginol-type diterpene from *Salvia officinalis*.** *Phytochemistry*, v. 31(4): p. 1307-1309, 1992 (11 ref, Eng).

A new oxygenated diterpene gamma-lactone, 12-methoxy-8,11,13-abietatrien-20,11-olide, a derivative of carnosic acid (carnosic acid 12-methyl ether gamma lactone), has been isolated from the aerial parts of *S.officinalis*, along with three known terpenoids: manool, rosmanol 7-ethyl ether and oleanic acid. the structures of all isolated compounds were established by spectroscopic data, some chemical reactions and were substantiated by X-ray diffraction.

9204-2425 Do J.C., Chai, J.Y., Son, K.H.* (Department of Food & Nutrition, Andong National University, Andong 760749, Korea) **Studies on the components of *Lycopus lucidus*.** *Korean Journal of Pharmacognosy*, v. 22(3): p. 162-165 , 1991 (11 ref, Kor, Eng).

Four triterpenoids were isolated from the leaves and stems of *L.lucidus* and identified as betulinic acid, oleanolic

acid,3-epimaslinic acid and cuscapic acid by spectroscopic methods.

9204-2426 Do, J.C., Jung, K.Y., Son, K.H. (Department of Food and Nutrition, Andong National University, Andong 760-749, Korea) **Steroidal saponins from the subterranean part of *Allium fistulosum*.** *Journal of Natural Products*, v. 55(2): p. 168-173 , 1992 (8 ref, Eng).

Structures of three new yuccagenin glycosides, named fistulosides A and B and C , isolated from the subterranean part of *A. fistulosum* were determined by chemical and spectral means. Two known diosgenin glycosides, dioscin and saponin P-d, were also isolated and identified.

9204-2427 Do, J.C., Chai, J.Y., Son, J.K. (College of Pharmacy, Yeungnam University, Kyongsan 712749, Korea) **Studies on the constituents of *Lycopus lucidus* (II).** *Korean Journal of Pharmacognosy*, v. 22(3): p. 166-170 , 1991 (11 ref, Kor, Eng).

Four compounds were isolated from the leaves and stems of *L.lucidus* and identified as 2 alpha hydroxy ursolic acid tormentic acid, beta sitosterol glucoside and linarin by spectroscopic methdos.

9204-2428 Dominguez, X.A., Sanchez, V.H. , Estrada, T.P. (Departamento de Quimica, ITESM Sucursal de Correos "J" 64849 Monterrey, NL, Mexico) **(Study of chemical constituents of *Hedyotis intricata*, Rubiaceae).** *Revista Latinoamericana de Quimica*, v. 22(4)+23(1): p. 46-47, 1992 (8 ref, Spa, Eng).

Lupeol, oleanolic acid, sucrose and asperuloside have been isolated from the whole plant of *H.intricata* and identified.

9204-2429 Dominguez, X.A., Sanchez, V.H. , Espinosa, B.G., Morton, M.C.B., Gonzalez, S.N.H., Puente, M.R.M. (Departamento de Quimica, ITESM, Sucursal de Correos "J" 64849 Monterrey, N.L.Mexico) **Bioactive isoflavonoids from "Kanawte" (*Piscidia piscipula*) Sarg..** *Revista Latinoamericana de Quimica*, v., 22(3): p. 94-95 , 1991 (9 ref, Eng, Spa).

From the bark of *P.piscipula*, a Huastecan medicinal tree, ictinone, piscidione and two new falvonoids hernan-corzine and sanchemarroquin have been isolated. Antimicrobial activity of the these compounds has also been investigated.

9204-2430 Dostal, J., Taborska, E., Slavik, J. (Department of Biochemistry, Faculty of Medicine, Masaryk University, Komenskeho Nam 2, CS-662 43 Brno, Czechoslovakia) **Preparative column chromatography of quaternary**

benzophenanthridine alkaloids of *Dicranostigma lacturoides*. *Fitoterapia*, v. 63(1): p. 67-69, 1992 (16 ref, Eng).

The quaternary benzo{c}phenanthridine alkaloids chelerythrine, sanguinarine and chelirubine were isolated from the roots of *D.lacturoides* by low pressure column chromatography.

9204-2431 Drewes, S.E., Taylor, C.W., Cunningham, A.B. (Department of Chemistry, University of Natal, Pietermaritzburg 3200, South Africa) **(+)-Afzelechin 3-rhamnoside from *Cassipourea gerrardii*.** *Phytochemistry*, v. 31(3): p. 1073-1075, 1992 (11 ref, Eng).

A new flavonol glycoside has been isolated from the bark of *C.gerrardii*. Its structure has been established from spectroscopic and hydrolytic studies as (+)-afzelechin 3-alpha-L-rhamnopyranoside.

9204-2432 Dubey, H., Tiwari, J.S.* (Department of Chemistry, Ravishankar University, Raipur 492010, MP, India) **Flavonoids and other constituents of *Sterculia* genus.** *Journal of the Indian Chemical Society*, v. 68(7): p. 426-427, 1991 (3 ref, Eng).

Air dried stem of *S.foetida* yielded leuco anthocyanidin-3-O-alpha-L-rhamnopyranoside, monorhamnoside of quercetin, 7-hydroxy-6-methoxy coumarin and an unknown compound.

9204-2433 Dung, N.X., Bien, L.K., Leclercq, P.A. (Department of Technical Chemistry, University of Hanoi 19 Le Thanh Tong Street, Hanoi, Vietnam) **The essential oil of *Amomum tasao-ko* Crevost et Lemarie from Vietnam.** *Journal of Essential Oil Research*, v. 4(1): p. 91-92, 1992 (5 ref, Eng).

The essential oil of the seeds of *A.tasao-ko* has been analyzed by a combination of GC and GC/MS. Twenty-one components have been identified, of which the major ones were found to be 1,8-cineole (30.6 percent), 2-decenal (17.3 percent), geranal (10.6 percent) and neral (7.0 percent).

9204-2434 Ehret, C., Maupetit, P., Petrzelka, M. (Roure, Centre de Recherche 34 Chemin de la Madeleine, B.P.72 06332 Grasse Cedex, France) **New organoleptically important constituents of *Narcissus* absolute (*Narcissus poeticus*) L..** *Journal of Essential Oil Research*, v. 4(1): p. 41-47, 1992 (9 ref, Eng).

A narcissus absolute, obtained by the hexane extraction of wild flowers, has been investigated thoroughly. GC and GC/MS analysis of its volatile and olfactively important fractions has led to the identification of over 80 new minor constituents in addition to almost 200 components already known in the literature. Among these more than 20 contribute significantly to the complex floral notes of this

absolute, which are reminiscent of jasmine, rose, violet, tuberose and orange flower.

9204-2435 Eisenreichova, E., Haladova, M., Buckova, A., Tomko, J., Uhrin, D., Ubik, K. (Department of Pharmacognosy and Botany, Pharmaceutical Faculty, Komensky University, 83232 Bratislava, Czechoslovakia) **A pyrrolidine-pyrrolidine alkaloid from *Lilium candidum* bulbs.** *Phytochemistry*, v. 31(3): p. 1084-1085, 1992 (4 ref, Eng).

A new alkaloid, 1-(2'-oxo-5'-pyrrolidinyl)-5-hydroxy-3-methyl-3-pyrrolin-2-one was isolated from the bulbs of *L.candidum*.

9204-2436 El-Khrisy, E.A.M., Nassar, M.I., Abu-Mustafa, E.A. (Natural Products Department, National Research Centre, Dokki, Cairo, Egypt) **Constituents of *Morus alba* leaves.** *Fitoterapia*, v. 63(1): p. 92, 1992 (18 ref, Eng).

n-Alkanes (C28 and C30-C34), beta-amyrin, beta-sitosterol, berapten, scopoletin and umbelliferone, were isolated from *M.alba* leaves and identified.

9204-2437 El-Sayed, N.H., El-Khrisy, E.A.M., Khadiga, M.A., Mabry, T.J. (National Research Centre, Dokki, Cairo, Egypt) **Flavonoids of *Conyza linifolia*.** *Revista Latinoamericana de Quimica*, v. 22(3): p. 89-90, 1991 (4 ref, Eng).

Five known flavonoids viz., vitexin, vicenin II, kaempferol 7-O-glucoside, isorhamnetin, and kaempferol, and two unreported flavonoids, isorhamnetin 3-O-rutinoside 4'-O-glucoside and 6-methoxyapigenin-7-methyl ether 4'-O-glucuronide have been isolated from the aerial parts of *C.linifolia* and characterized.

9204-2438 El-Sayed, N.H., Ishak, M.S., Kandil, F.E., Mabry, T.J. (National Research Centre, Dokki, Cairo, Egypt) **Flavonoids of *Otanthus maritimus*.** *Revista Latinoamericana de Quimica*, v. 22(4)+23(1): 1, 1992 (10 ref, Eng).

Eight known phenolics viz., acacetin 7-O-glucoside, vicenin II, sinchafatoside, isovitexin, acacetin, 6-C-alpha-L-rhamnosylapigenin, "X"-O-glucosylvitexin and isoferulic acid have been isolated from the aerial parts of the plant collected from sandy area around El-Arish, Sinai, Egypt.

9204-2439 Elliger, C.A., Waiss, A.C., Benson, M. (U.S. Department of Agriculture, Agricultural Research Service, Western Regional Research Center, 800 Buchanan Street, Albany, California 94710) **Petuniasterone R, a new ergostanoid from *Petunia parodii*.** *Journal of Natural Products*, v. 55(1): p. 129-133, 1992 (13 ref, Eng).

The ergostanoid petuniasterone R was present in dry *P.parodii* leaf at a concentration of 300 ppm. In addition to typical petuniasterone functionality of a bicyclic orthoester side chain and dienone A ring, it has an epoxy group at position 16alpha, 17alpha of ring D. Petuniasterone R reduces the growth of *Heliothis zea* larvae to 50 percent of control size at a concentration of ca.400 ppm in artificial diets.

9204-2440 Fleisher, Z., Fleisher, A.(Cromptom and Knowles Corporation, 1595 MacArthur Boulevard, Mahwah, NJ 07430, USA) **Volatiles of Ocimum basilicum traditionally grown in Israel. Aromatic plants of the holy land and the Sinai, Part VIII.** *Journal of Essential Oil Research*, v. 4(1): p. 97-99 , 1992 (7 ref, Eng).

O.basilicum traditionally used as a condiment by Jews, belongs almost exclusively to a linalool-methyl cinnamate type. Using GC/MS as the method of analysis, 63 constituents were identified in the oil of *O.basilicum* and its water-soluble fraction.

9204-2441 Fodor, G., Dharanipragada, R.(Department of Chemistry, West Virginia University, Morgantown, WV 26506-6045, USA) **Tropane alkaloids.** *Natural Product Reports*, v. 8(6): p. 603-612, 1991 (299 ref, Eng).

The literature published on tropane alkaloids during 1990 has been reviewed.

9204-2442 Foyere Ayafor, J., Tchaleu Ngadjul, B.(Department of Organic Chemistry, The University of Yaounde, Box 812, Yaounde, Cameroon) **Alkaloids, limonoids, and coumarins from Cameroonian Rutaceae: Highlights.** *7th Asian Symposium on Med. Plants, Spices, and Other Natural Prod. (ASOMPS VII).Manila*, 2-7 February 1992 (Eng).

Chemical investigations of five Cameroonian medicinal plants have been reported. The plants are: *Teclea grandifolia*, *Vepris lousii*, *Araliopsis tabouensis*, *Clausena anisata* and *Afraegele asso*. (Abstr.No. MO-5).

9204-2443 Fukai, T., Nomura, T.* (Faculty of Pharmaceutical Sciences, Toho University, 2-2-1, Miyama, Funabashi, Chiba 274, Japan) **Revised structures of albanins D and E, geranylated flavones from Morus alba.** *Heterocycles*, v. 32(3): p. 499-510, 1991 (21 ref, Eng).

The chemical shifts of the proton signals of the hydrogen-bonded hydroxyl groups of albanins D and E, isolated from *M.alba*, were compared with those of the hydroxyl groups of 6- or 8-isoprenoid substituted flavones to doubt the location of the geranyl groups of albanins D and E. The proposed structures for albanins D and E were

revised on the basis of the syntheses of 6-geranylated flavones and 8-geranylated flavones. JICST, Tokyo.

9204-2444 Furukawa, H.(Faculty of Pharmacy, Meijo University, Tempaku, Nagoya 468, Japan) **Structural elucidation of novel alkaloids from Citrus plants.** *Revista Latinoamericana de Quimica*, v. 22(3): p. 67-73 , 1991 (8 ref, Eng).

Structure elucidation of citropones (first examples of naturally occurring homoacridone alkaloids containing seven membered ring system) isolated from *C.grandis f.buntan* and *C.natsudaidai*, and acrimarine alkaloids (novel acridone alkaloids carrying a coumarin unit) isolated from roots of some *Citrus* spp, has been discussed.

9204-2445 Gaggelli, E., Valensin, G. , Stolowich, N., Williams, H.J., Scott, A.I.(Department of Chemistry, University of Siena, Pian dei Mantellini 44,53100 Siena, Italy) **Conformation of vinblastine in aqueous solution determination by 2D 1H-and 13C-NMR spectroscopy.** *Journal of Natural Products*, v. 55(3): p. 285-293 , 1992 (27 ref, Eng).

The conformation of vinblastine in H₂O solution at pD in the range 4,8-6,6 has been delineated by interpreting 1H-nmr 2D COSY and NOESY maps, 1H-13C2D correlated spectra, and the pattern of proton-proton scalar couplings. A molecular model of the preferred spatial arrangement has been obtained and compared with the structure previously determined in organic solvents. The dihedral angle between the two indole moieties has been evaluated at ca.180 degree C as compared to the value of 160 degree C in organic solution.

9204-2446 Ganguly, S.N.(Bose Institute, Calcutta 700 009, India) **A new triterpene from the leaves of Sonneratia apetala.** *7th Asian Symposium on Med. Plants, Spices and Other Natural Prod.(ASOMPS VII).Manila*, 2-7 February 1992 (Eng).

Chromatography of the petroleum ether extract of the leaves of *S.apetala* over silica gel yielded a white solid, crystallised from benzene chloroform (C₃₂H₅₀O₃, mp 268 degrees). It showed positive Liebermann-Burchard test for triterpene. Its structure has been discussed. (Abstr. No. MP-10).

9204-2447 Glavac, D., Ravnik-Glavac, M.(Boris Kidric Institute of Chemistry, Hajdrihova 19, Ljubljana) **Colchifoline, N-deacetyl-N-acetoacetylcolchicine and their 2-demethyl derivatives in seeds and leaves of Colchicum autumnale L..** *Acta Pharmaceutica Jugoslavica*, v. 41(3): p. 243-249 , 1991 (11 ref, Eng).

Colchifoline and 2-demethylcolchifoline have been isolated from a neutral phenolic extract of the leaves, while colchifoline, 2-demethylcolchifoline and N-deacetyl-N-acetoacetylcolchicine have been isolated from a neutral phenolic extract of the seeds of *C. autumnale*. 2-Demethyl and the beta-and gamma-lumiderivatives of colchifoline and N-deacetyl-N-acetoacetylcolchicine have been prepared by acid hydrolysis and photochemical reaction respectively.

9204-2448 Goh, S.H., Jantan, I., Gray, A.I., Waterman, P.G. (Chemistry Department, University of Malaya 59100 Kuala Lumpur, Malaysia) **Prenylated xanthones from *Garcinia opaca*.** *Phytochemistry*, v. 31(4): p. 1383-1386, 1992 (22 ref, Eng).

Macluraxanthone, 1,3,5-trihydroxy-6',6'-dimethylpyrano-(2',3':6,7)-4-(1,1-dimethylprop-2-enyl)xanthone and two new prenylated xanthones, 1,3,5-trihydroxy-6',6'-dimethylpyrano(2',3':6,7)-2-(3-methylbut-2-enyl)-4-(1,1-dimethylprop-2-enyl)xanthone and 4",5"-dihydro-1,5-dihydro-1,5-dihydroxy-6',6'-dimethylpyrano(2',3':6,7)-2-(3-methylbut-2-enyl)-4",4",5"-trimethylfuranol(2",3":3,4)xanthone, have been isolated from the leaf extract of *G. opaca*. The structures of these compounds were established on the basis of 2D NMR and other spectroscopic techniques.

9204-2449 Gonzalez Gonzalez, A., Ravelo, A.G., Irizar, A.C., Fernandez Fernandez, M. (Centro de Productos Naturales Organicos "Antonio Gonzalez", Instituto Universitario de Bio-Organica, Universidad de La Laguna, Tenerife, Islas Canarias, Espana) **Novel proanthocyanidins of type A from *Prunus spinosa* L. (Rosaceae).** *Revista Latinoamericana de Quimica*, v. 22(3): p. 91-93, 1991 (15 ref, Eng).

Proanthocyanidines isolated from the branches of *P. spinosa* have been identified by spectroscopic technique.

9204-2450 Gonzalez Gonzalez, A., Luis, J.G., Mendoza, J.J., Ravelo, A.G., Dominguez S., X.A. (Centro de Productos Naturales Organicos "Antonio Gonzalez", Universidad de la Laguna, Corr. de la Esperanza, 2. La Laguna 38206 Tenerife, Canary Islands, Spain) **Novel friedooleane type triterpenes from *Schaefferia cuneifolia*.** *Revista Latinoamericana de Quimica*, v. 22(4)+23(1): p. 22-24, 1992 (7 ref, Eng).

Two new rearranged friedooleane triterpenes have been isolated from the roots of *S. cuneifolia* and their structures elucidated as 3-oxo-25(9 to 8)abeo-friedoolean-4(23)-en-24 to 1-olida and 3-oxo-25(9 to 8)abeo-friedoolean-4(23)-en-24-ol.

9204-2451 Gonzalez, A.G., Munoz, O.M., Ravelo, A.G., Crespo, A., Bazzocchi, I.L., Jimenez, I.A., Solans, X., Ruiz-Perez, C., Rodriguez-Romero, V. (CPNO, Antonio Gonzalez, Instituto de Bio-Organica, Universidad de la Laguna, Carretera la Esperanza 2, La Laguna, 38206 Tenerife, Canary Islands, Spain) **A new sesquiterpene from *Maytenus boaria* (Celastraceae) crystal structure and absolute configuration.** *Tetrahedron Letters*, v. 33(14): p. 1921-1924, 1992 (16 ref, Eng).

From the aerial parts of *M. boaria*, a new sesquiterpene diol(C15H26O3; mp 146-47 degree), with a 4R configuration was isolated and studied by X-ray diffraction analysis and application of the Horeau method. IARI, New Delhi.

9204-2452 Gorunovic, M.O.*, Panov, I., Chalchat, J.C., Garry, R.P., Michet, A. (Department of Pharmacognosy, Faculty of Pharmacy, University of Belgrade, POB 146, Belgrade, Yugoslavia) **The quality of wild-growing carawey, *Carum carvi* L., from Montenegro.** *Acta Pharmaceutica Jugoslavica*, v. 41(3): p. 267-271, 1991 (16 ref, Eng).

The quality of the collected carawey fruits (*Carvi fructus*), regarding the essential oil content, is twice better than that specified by the Pharmacopoeia (4.7-6.0 percent compared to 3.0 percent). The carvone content in the essential oils is also higher than the Pharmacopoeia requirement (56.8-64.3 percent) compared with 50.0 percent). Using the methods of gas chromatography-mass spectrometry 38 compounds were confirmed, with carvone (54.4 percent) and limonene (36.9 percent) as predominant constituents.

9204-2453 Gunasegaran, R., Sree Vidya, H. (Department of Chemistry, Centre for Postgraduate Studies, Pondicherry 605008, India) **Chemical investigation of the flavonoids of *Martynia annua*.** *Fitoterapia*, v. 63(1): p. 88-89, 1992 (3 ref, Eng).

From *M. annua* flowers, flavonoids, 5,7,4'-trihydroxy-3'-methoxyflavone (0.01 percent) and 3'-methoxy-4',5,7-trihydroxyflavone-7-O-beta-D-glucuronide (0.05 percent) were isolated and identified.

9204-2454 Gunasegaran, R. (Department of Chemistry, Centre for Postgraduate Studies, Pondicherry-605008, India) **Flavonoids and anthocyanins of three oxalidaceae.** *Fitoterapia*, v. 63(1): p. 89-90, 1992 (2 ref, Eng).

From *Oxalis corniculata* leaves C-glycosyl flavonoids: 5,7,4'-trihydroxy-8-C-beta-D-glucopyranoside (vitexin) (0.02 percent), 5,7,4'-trihydroxy-6-C-beta-D-glucopyranoside (isovitexin) (0.01 percent) and vitexin-2"-O-beta-D-glucopyranoside (0.05 percent) were

isolated. Flowers of *Averrhoa bilimbi* yielded cyanidin-3-O-beta-D-glucoside (0.01 percent) while flowers of *A.carambola* yielded cyanidin-3-beta-O-beta-D-glucoside (0.01 percent) and cyamidin-3,5-O-beta-D-diglucoside (0.03 percent).

9204-2455 Hanlidou, E., Kokkalou, E., Kokkini, S.* (Institute of Systematic Botany and Phytogeography, School of Biology, University of Thessaloniki, 54006 Thessaloniki, Greece) **Volatile constituents of Achillea grandifolia.** *Planta Medica*, v. 58(1): p. 105-107, 1992 (25 ref, Eng).

Volatile constituents of *A.grandifolia* growing wild in Greece were studied by means of GC and GC-EIMS. Sixty constituents were identified. The main components were camphor, alpha-and beta-thujone, and 1,8-cineole. Twenty-six constituents have not been previously reported in the essential oils of the genus Achillea.

9204-2456 Haraguchi, M., Gimaraes, R.D.B. (Secao de Bioquimica Animal, Instituto Biologico 04014-Sao Paulo-Brasil) **Microhydrolysis of flavonoids in TLC.** *Revista Latinoamericana de Quimica*, v. 22(4)+ 23(1): p. 37-38, 1992 (5 ref, Eng).

The flavonoid glucoside, isolated from the leaves of *Holocalyx glaziovii* (a known toxic plant which provokes photosensitization in cattle), has been identified as 3-O-(glucopyranosyl-(1-4)-rhamnopyranosyl)-7-O-rhamnopyranosylkaempferol.

9204-2457 Haraguchi, M., Nobre, D., Guimaraes, R.D.B., Maria, H.S., Morita, H., Takeya, K., Itokawa, H. (Secao de Bioquimica Animal, Instituto Biologico, 04014-Sao Paulo-Brasil) **Occurrence of procyanidin in the toxic fraction from Riedeiella graciliflora.** *Revista Latinoamericana de Quimica*, v. 22(4)+23(1): p. 34-36, 1992 (6 ref, Eng).

The toxic fractions of ethanolic extract of leaves of *R.graciliflora* afforded rutin and procyanidin B3. Its products of thiolytic degradation have also been identified. Fresh leaf juice has been found to be lethal to guinea pigs when given orally.

9204-2458 Haro, G., Kakisawa, H.* (Department of Chemistry, University of Tsukuba, Tsukuba, Ibaraki 305, Japan) **Miltipolone, a new diterpenoid tropolone possessing cytotoxic activities from Salvia miltiorrhiza Bunge.** *Chemistry Letters*, No. 9 p. 1599-1602, 1990 (8 ref, Eng).

A potent cytotoxic compound, miltipolone (N19H24O3, mp 132 degree C), isolated from the fresh root of *S.miltiorrhiza* has been determined to have a novel tropolonoid norditerpene structure. It is the first diterpenoid

tropolone possessing potent cytotoxic activities. JICST, Tokyo.

9204-2459 Hasan, C.M., Hussain, S., Ferdous, A.J. (Department of Pharmacy, University of Dhaka, Dhaka-1000, Bangladesh) **Alkaloids from the stem bark of Desmos longiflora.** *7th Asian Symposium on Med. Plants, Spices and Other Natural Prod. (ASOMPS VII).* Manila, 2-7 February 1992 (Eng).

D.longiflora is the only species of the genus *Desmos* available in Bangladesh. From the chloroform extract five alkaloids were isolated by PTLC (over silica) of which one is noraporphine (xylopine), three are oxoaporphines (athrospermidine, oxonbuxifoline and lanuginosine) and one is tetrahydroberberine (coreximine). The structure of these were elucidated by using high resolution PMR (250 MHz.) The structure of coreximine was confirmed also by 2D NMR (COSY, NOESY etc.) All these alkaloids are the first report from the genus *Desmos* and oxobuxifoline seems to be the first record from Annonaceae. (Absr. No. MP-97).

9204-2460 Hasler, A., Gross, G.A., Meier, B., Sticher, O. (Department of Pharmacy, Swiss Federal Institute of Technology (ETH) Zurich, CH 8092, Zurich, Switzerland) **Complex flavonol glycosides from the leaves of Ginkgo biloba.** *Phytochemistry*, v. 31(3): p. 1391-1394, 1992 (8 ref, Eng).

Five new flavonol glycosides were isolated from the leaves of *G.biloba* and their structures determined by spectroscopy and hydrolysis experiments.

9204-2461 Higa, M., Ohshiro, T., Ogihara, K., Yogi, S. (College of Science, University of the Ryukyus, Nishihara, Okinawa 903-01, Japan) **Flavonoid constituents of Melicope triphylla Merr. II.** *Yakugaku Zasshi*, v. 11(11): p. 822-827, 1990 (23 ref, Eng, Jap).

From the leaves of *M.triphylla*, three new flavonoids (1-3) were isolated, together with nine known flavonoids, 4',5-dihydroxy-3,3',7-trimethoxyflavone, 5-hydroxy-3,3',4',7-tetramethoxyflavone, 3,3',4',5,7-pentamethoxyflavone, 7-hydroxy-3,3',4',5,8-pentamethoxyflavone, 3,3',4,5,7,8-hexamethoxyflavone, 5-hydroxy-3,7,8-trimethoxy-3',4'-methylenedioxyflavone, 7-hydroxy-3,5,8-trimethoxy-3',4'-methyl-enedioxyflavone, 3,5,7,8-tetramethoxy-3',4'-methylenedioxyflavone, and 5-hydroxy-3,6,7,8-tetramethoxy-3',4'-methylenedioxyflavone. The structures of 1,2 and 3 were established as 5-hydroxy-3,7-dimethoxy-3',4'-methylenedioxyflavone, 5-hydroxy-7-isopentenyl-3,8-dimethoxy-3',4'-methylenedioxyflavone, and 4'-hydroxy-7-isopentenyl-3',5,8-tetramethoxyflavone by their respective chemical

and spectral data. The 20 flavonoids isolated from this plant were examined for the piscicidal activities.

9204-2462 Hirakura, K., Morita, M., Nakajima, K., Ikeya, Y., Mitsuhashi, H. (Research Institute for Biology and Chemistry, Tsumura & Company, 3586 Yoshiwara, Ammimachi, Inashiki-gun, Ibaraki, Japan) **Three acetylenic compounds from roots of Panax ginseng.** *Phytochemistry*, v. 31(3): p. 899-903, 1992 (9 ref, Eng).

Three new acetylenic compounds named ginsenoynes i-k were isolated from a hexane extract of the roots of *P.ginseng*. Their structures were determined by spectral and chemical methods.

9204-2463 Hufford, C.D., Ogunimein, B.O., Muhammad, I. (Department of Pharmacognosy and Research Institute of Pharmaceutical Sciences, School of Pharmacy, The University of Mississippi, University, Mississippi 38677) **New stemodane diterpenes from Stemodia maritima.** *Journal of Natural products*, v. 55(1): p. 48-52, 1992 (8 ref, Eng).

EtOH extraction of n-hexane defatted *S.maritima* yielded four new stemodane diterpenes after solvent partitions and chromatographic separations. These diterpenes have been identified as maristeminol and stemodinosides A, B and C from ¹³C-nmr comparisons with stemodin. The antiviral activity and cytotoxicity of these derivatives were tested, but they were essentially not active.

9204-2464 Hussain, S.F., Siddiqui, M.T. (Natural Drugs Division, PCSIR Laboratories, Jamrud Road, Peshawar, Pakistan) **Alkaloidal constituents of Corydalis stewartii.** *Planta Medica*, v. 58(1): p. 108, 1992 (14 ref, Eng).

Six known isoquinoline alkaloids, hitherto unreported from *C.stewartii*, have been isolated and characterized. The alkaloids isolated from the plant belong to the spirobenzylisoquinolines: (+)-yenhusomidine, the protoberberines: (-)-cheilanthifoline, (-)-scoulerine, and (+)-stylopine, the protopines; cryptopine, and the promorphinane group: (-)-sinoacutine. While several of the alkaloids isolated from *C.stewartii* are commonly found in *Corydalis* species, the occurrence of (+)-yenhusomidine is rare.

9204-2465 Ikeshiro, Y., Todo, Y., Mase, I., Tomita, Y., Tanaka, S., Herath, W.H.M.W. (Department of Pharmacognosy and Phytochemistry, Niigata College of Pharmacy, 5-13-2 Kamishinei-cho, Niigata 950-21, Japan) **Iridoid glucosides from the fruits of Lonicera morrowii.** *Planta Medica*, v. 58(1): p. 109, 1992 (8 ref, Eng).

The isolation of iridoid glucosides viz.; kingiside, morroniside, loganin, 7-ketologanin, secocyclogaganin and secologanin dimethyl acetal from the fresh fruits of *L.morrowii* has been reported.

9204-2466 Ikeya, Y., Sugama, K., Okada, M., Mitsuhashi, H. (Research Institute for Biology & Chemistry, Tsumura & Co., 3586 Yoshiwara Ami-machi, Inashiki-gun, Ibaraki 300-11, Japan) **Four new phenolic glycosides from Polygala tenuifolia.** *Chemical & Pharmaceutical Bulletin*, v. 39(10): p. 2600-2605, 1991 (11 ref, Eng).

Four new phenolic glycosides, tenuifolisides A, B, C, and D together with a known phenolic glycoside, beta-D-(3-O-sinapoyl)-fructofuranosyl-alpha-D-(6-O-sinapoyl)-glucopyranoside were isolated from the roots of *P.tenuifolia*. The structures of these new compounds were characterized on the basis of chemical and spectral evidence including two dimensional nuclear magnetic resonance studies.

9204-2467 Ilieva, E.I., Handjieva, N.V., Popov, S.S. (Institute of Organic Chemistry with Centre of Phytochemistry, Bulgarian Academy of Sciences, Sofia 1113, Bulgaria) **Iridoid glycosides from Linaria vulgaris.** *Phytochemistry*, v. 31(3): p. 1040-1041, 1992 (11 ref, Eng).

Two new antirrinoside derivatives, 6-O-trans-p-coumaroyl antirrinoside and 6-O-cis-p-coumaroyl-antirrinoside, have been isolated from aerial parts of *L.vulgaris*. In addition, antirrinoside and procumbide have been isolated. Procumbide has been found for the first time in Scrophulariaceae.

9204-2468 Innocenti, G., Cappelletti, E.M.* , Caporale, G. (Dipartimento di Scienze Farmaceutiche, Universita' di Padova, 35131 Padova, Italy) **Furocoumarin contents in the vegetative organs of cultivated Psoralea species.** *International Journal of Pharmacognosy*, v. 29(4): p. 311-316, 1991 (25 ref, Eng).

Furocoumarin content was investigated in the different vegetative organs of several cultivated *Psoralea* species *P.macrostachya*, *P.onobrychis*, *P.glandulosa* and *P.bituminosa*. The linear furocoumarin psoralen and its angular isomer angelicin are ubiquitously present, although their concentrations vary greatly in different species and plant organs. The vegetative organs of some *Psoralea* species can be regarded as interesting natural furocoumarin sources, considering their great biomass production. The importance of the co-occurrence of both isomers as chemical markers for the genus *Psoralea* and of their ratio as a specific character, is confirmed.

9204-2469 Isobe, T., Noda, Y. (Department of Chemistry, Hyogo College of Medicine: Mukogawa-cho, Nishinomiya-shi 663, Japan) **Studies on the chemical constituents of Salvia japonica and S.glabrescens.** *Nippon Kagaku Kaishi*, No. 3 p. 244-246, 1991 (6 ref, Eng, Jap).

Several compounds were isolated from two Japanese wild *Salvia* species, *S.japonica* and *S.glabrescens*. They were triterpenoids, steroids, a phenolic compounds, and a carbohydrate, but a diterpenoids was not found. Their structures were identified as beta-sitosterol, beta-sitosterol glucoside, ursolic acid, oleanolic acid, 2alpha-hydroxyursolic acid, maslinic acid, tormentic acid, caffeic acid, and ethyl beta-D-galactopyranoside by the comparison of spectroscopic data with those of the authentic samples. JICST, Tokyo.

9204-2470 Ito, C., Fujiwara, K., Kajita, M., Ju-Ichi, M., Takemura, Y., Suzuki, Y., Tanaka, K., Omura, M., Furukawa, H.* (Faculty of Pharmacy, Meijo University, Tempaku, Nagoya, 468, Japan) **New coumarins from Citrus plants.** *Chemical & Pharmaceutical Bulletin*, v. 39(10): p. 2509-2513, 1991 (35 ref, Eng).

Four new coumarins, named peroxytamarin, cis-casegravol, citrusarin-A, and citrusarin-B, were isolated from root of Citrus plants and their structures were elucidated by chemical and spectrometric methods. Citrusarin-B, a coumarin having both a dimethylpyran ring and a dihydrofuran ring in the molecule, was also synthesized.

9204-2471 Ito, C., Kanbara, H., Wu, T.S., Furukawa, H. (Faculty of Pharmacy, Meijo University, Tempaku, Nagoya 468, Japan) **Murrayamine-C from *Murraya euchrestifolia*.** *Phytochemistry*, v. 31(3): p. 1083-1084, 1992 (7 ref, Eng).

Murrayamine-C, a new carbazole alkaloid, was isolated from fruit of *M.euchrestifolia* and its structure was established by spectrometric methods.

9204-2472 Ito, C., Nakagawa, M., Wu, T.S., Furukawa, H.* (Faculty of Pharmacy, Meijo University, Tempaku, Nagoya 468, Japan) **New carbazole alkaloids from *Murraya euchrestifolia*.** *Chemical & Pharmaceutical Bulletin*, v. 39(10): p. 2525-2528, 1991 (8 ref, Eng).

Five new monomeric carbazoles named murrayaline-B, -C and -D, pyrayafoline-E and euchrestine-E, one carbazolequinone named murrayquinone-E, and two dimeric carbazoles named bismurrayafoline-C and -D were isolated along with known carbazoles from the stem bark of *M.euchrestifolia*. The structures of new alkaloids were elucidated by spectrometric and/or chemical methods. The new monomeric carbazoles were found to have 2-oxygenated 3-C-substituted carbazole nuclei and the new dimeric carbazoles to have symmetrical structures containing a 1-oxygenated 3-methylcarbazole skeleton.

9204-2473 Itoh, A., Tanahashi, T., Nagakura, N. (Kobe Women's College of Pharmacy, Higashinada-ku, Kobe 658, Japan) **6'-O-feruloyl-and 6'-O-sinapoyl-demethylalangisides, tetrahydroisoquinoline-monoterpene glucosides from *Alangium platanifolium*.** *Phytochemistry*, v. 31(3): p. 1037-1040, 1992 (11 ref, Eng).

From the leaves of *A.platanifolium* var. *trilobum*, two new tetrahydroisoquinoline-monoterpene glucosides, 6'-O-feruloyl-demethylalangiside and 6'-O-sinapoyl-demethylalangiside, were isolated along with demethylalangiside. Their structures were determined by spectroscopic methods.

9204-2474 Jaggy, H., Achenbach, H. (Institut fur Pharmazie und Lebensmittelchemie, Universitat Erlangen, D(W)-8520 Erlangen, Federal Republic of Germany) **Cepharadione A from *Piper methysticum*.** *Planta Medica*, v. 58(1): p. 111, 1992 (7 ref, Eng).

During the isolation of kawapyrones from *P.methysticum*, a very small amounts of a highly fluorescent orange-coloured compound was isolated. The structure of which was determined by spectroscopic investigations, especially ¹³C-NMR. It was revealed to be cepharadione A.

9204-2475 Jain, A.K., Srivastava, S.K., Srivastava, S.D. (Department of Chemistry, Dr. Harisingh Gour Vishwavidyalaya, Sagar-470003, MP, India) **Some new constituents from heartwood of *Aegle marmelos* Corr..** *Journal of The Indian Chemical Society*, v. 68(8): p. 452-454, 1991 (8 ref, Eng).

Two new compounds, 2-(2-hydroxy-4-methoxyphenyl) vinyl acetate and xanthotoxol-8-O-beta-D-glucopyranoside have been isolated from the heartwood of *A.marmelos* along with beta-sitosterol and lupeol. The structures of these compounds have been established on the basis of spectral data and chemical evidences.

9204-2476 Jakupovic, J., Ganzer, U., Pritschow, P., Lehmann, L., Bohlmann, F., King, R.M. (Institute for Organic Chemistry, Technical University of Berlin, D-1000 Berlin 12, Germany) **Sesquiterpene lactones and other constituents from *Ursinia* species.** *Phytochemistry*, v. 31(3): p. 863-880, 1992 (61 ref, Eng).

From 12 *Ursinia* species, in addition to known compounds, 31 new sesquiterpene lactones, 10 being germacranolides, 19 guianolides, one eudesmanolide and a rearranged one, were isolated. Furthermore, seven sesquiterpene acids and methyl esters, including two fulvenes and a rearranged eudesmane, a nerolidol and seven farnesol derivatives, a furosesquiterpene derived from

dehydrolasiospermane, three eudesmane and three eremophilane derivatives as well as a triynene were present.

9204-2477 Jantan, I., Hock, G.S.* (Chemistry Department, University of Malaya, 59100 Kuala Lumpur, Malaysia) **Structural elucidation of novel alkaloids from Aromadendron elegans.** *7th Asian Symposium on Med. Plants, spices, and Other Natural Prod. (ASOMPS VII). Manila, 2-7 February 1992* (Eng).

1H, 13C and 2D NMR and other spectroscopic techniques have been carried out to elucidate the structures of two new and five known aporphine alkaloids from the heartwood of *A.elegans*. The new bases were identified as N-acetylanonaine N-oxide and 1-(N-acetyl-N-methylamino) ethyl-3,4,6-trimethoxy-7-hydroxyphe-
nanthrene. (Abstr. No. MO-3).

9204-2478 Jia, Z., Zhang, Z. (Institute of Organic Chemistry, Lanzhou University, Lanzhou 730000, PRC) **Taxanes from Taxus chinensis (III).** *Chinese Science Bulletin*, v. 36(23): p. 1967-1969, 1991 (8 ref, Eng).

Structure elucidation of four out of eight new taxane diterpenes isolated from *Taxus chinensis* has been reported.

9204-2479 Jiang, X., Yunbao, M., Yunlong, X. (The Laboratory of Phytochemistry, Kunming Institute of Botany, Academia Sinica, Kunming 650204, Yunnan, China) **Diterpenoids from Siegesbeckia pubescens.** *Phytochemistry*, v. 31(3): p. 917-921, 1992 (6 ref, Eng).

Three new ent-kaurane-type diterpenoids, siegesbeckioside, siegesbeckiol and siegesbeckic acid, were isolated together with five known diterpenes from *S.pubescens* (Xi-Xian). On the basis of chemical and spectral evidences, their structures were elucidated.

9204-2480 Jin, Q.D., Mu, Q.Z. (Laboratory of Phytochemistry, Kunming Institute of Botany, Chinese Academy of Sciences, Kunming 650204) **Study on glycosidal constituents from Epigynum auritum.** *Acta Pharmaceutica Sinica*, v. 26(11): p. 841-845, 1991 (5 ref, Eng).

A known compound and a new glycoside, epigeoside, were isolated from the rhizomes of *E.auritum*. The structure of known compounds was identified as daucosterol (beta-sitosterol-beta-D-glucopyranoside). The structure of epigeoside has been deduced on the basis of spectral analysis and chemical reaction as catechin-3-O-alpha-L-rhamnopyranosyl-(1 to 4)-beta-D-glucopyranosyl-(1 to 6)-beta-D-glucopyranoside. Partial hydrolysis of II with 0.2 mol/L HCl afforded compound IIa and rhamnose. Acid hydrolysis of IIa with 2 mol/L HCl afforded an aglycone

which was identified by comparison with catechin and glucose.

9204-2481 Johns, M.R., Johns, J.E., Rudolph, V. (Department of Chemical Engineering, The University of Queensland, Queensland 4072, Australia) **Steam distillation of tea tree (*Melaleuca alternifolia*) oil.** *Journal of the Science of Food and Agriculture*, v. 58(1): p. 49-53, 1992 (10 ref, Eng).

The results demonstrate that the oil components can be divided into two main groups according to their distillation behaviour. Oxygenated components, particularly terpinen-4-ol and 1,8-cinole, are recovered the most rapidly, despite their high boiling points relative to other components. Their rates of recovery are increased with increasing steam rate, but are insensitive to leaf maceration. A second group of components, characterised by either a hydrophobic structure (the monoterpenes) or a larger molecular size (sesquiterpenes), exhibited the opposite behaviour. The rates of recovery of these compounds were unaffected by steam rate and impeded by leaf maceration.

9204-2482 Jordan, E.D., Hsieh, T.S.C., Fischer, N.H.* (Department of Chemistry, Louisiana State University and Agricultural and Mechanical College, Baton Rouge LA 70803, USA) **Volatile compounds from leaves of Ceratiola ericoides by dynamic headspace sampling.** *Phytochemistry*, v. 31(4): p. 1203-1208, 1992 (20 ref, Eng).

C.ericoides is a shrub endemic to the Florida scrub community and has been investigated in conjunction with studies of allelopathic interactions that affect members of the adjacent sandhill community. Headspace volatiles of *C.ericoides* leaves collected in spring, summer and autumn were adsorbed on Tenax TA, the mally desorbed, cryogenically refocused, and identified by GC-MS. In spring leaves, hydrocarbons were most prevalent, while alcohols, aldehydes and ketones were most abundant in summer leaves. Esters were the major components in autumn leaves.

9204-2483 Ju, Y., Jia, Z.J.* (State Key Laboratory of Applied Organic Chemistry, Lanzhou University, Lanzhou 730000, PR, China) **Steroidal saponins from the rhizomes of Smilax menispermoidea.** *Phytochemistry*, v. 31(4): p. 1349-1351, 1992 (13 ref, Eng).

Four steroidal saponins were isolated from the dried rhizomes of *S.menispermoidea*. One of them is new and its structure was established as (25S)spirost-5-en-3beta,17alpha-triol-3-O-alpha-L-rhamnopyranosyl(1 to 2)alpha-L-rhamnopyranosyl(1 to 4)-beta-D-glucopyranoside using spectrometry and chemical methods, as well as comparison with three known steroidal saponins, dioscin, methyl protodioscin and pseudoprotodioscin.

9204-2484 Julkunen-Tiitto, R., Meier, B.(Department of Biology, University of Joensuu, Box 111, SF 80101 Joensuu 10, Finland) **Variation in growth and secondary phenolics among field-cultivated clones of *Salix myrsinifolia*.** *Planta Medica*, v. 58(1): p. 77, 1992 (17 ref, Eng).

Nine *S.myrsinifolia* used in herbal drugs production clones were studied for secondary phenolics and phytomass production in an old, unfertilized hayfield after the second growing season. The leaf and stem phytomass varied significantly among clones, but more than 70 percent of the total variation could be explained by within-clonal phytomass variation. Similarly, the accumulation of salicin, salicortin, chlorogenic acid (+)-catechin, proanthocyanidins and unknowns varied significantly according to source (tissue, individual, or clone), and in most cases the environmental (within-clonal) variation was nearly as high as the genetic variation (between-clones).

9204-2485 Kelly, H.A., Robins, D.J.(Department of Chemistry, University of Glasgow, Glasgow G12 8QQ, UK) **Pyrrolizidine alkaloids from *Cynoglossum macrostylum*.** *Fitoterapia*, nv. 63(1): p. 91, 1992 (4 ref, Eng).

From *Cynoglossum macrostylum* plants (+)-echinatine(0.6 percent) and (-)-heliosupine (0.2 percent) were isolated and identified.

9204-2486 Kemertelidze, E.P., Gvazava, L.N. , Alania, M.D., Kikoladze, V.S. , Tsitsishvili, V.G.(I.G.Kutateladze Institute of Pharmacochemistry, Georgian Academy of Science, Tbilisi 380059, USSR) **Digitoside, a novel triterpene glycoside from *Digitalis ciliata*.** *Journal of Natural Products*, v. 55(2): p. 217-220 , 1992 (13 ref, Eng).

A new pentacyclic triterpene glycoside, digitoside (mp 229-31 degree C), has been isolated from the leaves of *D.ciliata*. Its structure has been established as 3-O-beta-xylopyranosyl-(1to4)-alpha-rhamnopyranosyl-28-O-beta-D-glucopyranosyl-(1to6)-beta-D-glucopyranosyl-oleanolic acid through chemical and spectral studies.

9204-2487 Khalil, A.T., Halim, A.F., Ogata, K., Sekine, T., Murakoshi, I.(Faculty of Pharmacy, Mansoura University, Mansoura, Egypt) **(-)-1-Methylcorypalline, an isoquinoline alkaloid from *Arthrocneumum glaucum*.** *Phytochemistry*, v. 31(3): p. 1023-1025, 1992 (20 ref, Eng).

Two isoquinoline alkaloids, (+)-1,2-dimethyl-6,7-dimethoxy-1,2,3,4-tetrahydroisoquinoline [(+)-carnegine] and (-)-1,2-dimethyl-6-methoxy-7-hydroxy-1,2,3,4-tetrahydroisoquinoline [(-)-1-methylcorypalline], were isolated from the aerial parts of *A.glaucum*. Their structures were determined by spectroscopic (UV, IR, MS, 1D and 2D NMR) and also by X-ray analyses. This is the

first evidence for the presence of the laevo isomer of 1-methylcorypalline in nature.

9204-2488 Khan, M.S.Y., Javed, K., Khan, M.H.(Department of Medicinal Chemistry, Jamia Hamdard, Hamdard Nagar, New Delhi-110062) **Chemical Constituents of the aerial parts of *Sisymbrium irio*.** *Journal of The Indian Chemical Society*, v. 68(9): p. 532 , 1991 (5 ref, Eng).

Aerial parts of the plant on ethanolic extract yielded beta-sitosterol and beta-sitosterol-3beta-glucoside isorhamnetin and quercetin.

9204-2489 Khan, M.S.Y., Javed, K., Khan, M.H.(Division of Medicinal Chemistry, Jamia Hamdard, Hamdard Nagar, New Delhi 110062, India) **Constituents of the flowers of *Dodonaea viscosa*.** *Fitoterapia*, nv. 63(1): p. 83-84, 1992 (23 ref, Eng).

From the flowers of *Dodonaea viscosa*, penduletin, quercetin, isorhamnetin, doviscogenin were isolated and identified.

9204-2490 Kikuchi, Y., Miyaichi, Y. , Yamaguchi, Y., Tomimori, T. (School of Pharmacy, Hokuriku University, 3 Ho, Kanagawa-machi, Kanazawa 920-11, Japan) **Studies on Nepalese crude drugs (XV) Phenolic compounds from the aerial parts of *Scutellaria prostrata* Jacq.ex Benth.** *Shoyakugaku Zasshi*, v. 45(4): p. 345-348, 1991 (12 ref, Eng).

From the aerial parts of *S.prostrata*, three compounds were isolated, together with three known glycosides of phenylethanoid and twenty-four known flavonoids. On the basis of the chemical and spectral evidences, The compounds were identified as 2-carboxymethyl-3,5-dihydroxybiphenyl(1) 2-carboxyethyl-3,5-dihydroxybiphenyl(2) and isoscutellarein 7-O-beta-D-glucuronopyranoside, respectively. Compounds 1 and 2 were isolated from a natural source for the first time in this work.

9204-2491 Kishi, K., Yoshikawa, K.* , Arihara, S.(Faculty of Pharmaceutical Sciences, Tokushima-Bunri University, Tokushima, Tokushima 770, Japan) **Limonoids and protolimonoids from the fruits of *Phellodendron amurense*.** *Phytochemistry*, v. 31(4): p. 1335-1338, 1992 (14 ref, Eng).

Two novel limonoids, named kihadalactone A and B, have been isolated from the fresh fruits of *P.amurense*. along with seven tirucallanes triterpenoids, niloticin, dihydroniloticin, niloticin acetate, piscidinol A, hispidol B, bourjotinolone A, and hispidone. Their structures were established on the basis of spectral and chemical evidence.

Further NMR spectral analysis of the tirucallanes showed that the reported shifts of C-13 and C-14 should be revised.

9204-2492 Kisiel, W.(Institute of Pharmacology, Polish Academy of Sciences, 31-343 Krakow, Poland) **Sesquiterpene lactones from *Picris hieracioides* subsp. *hieracioides*.** *Planta Medica*, v. 58(1): p.115, 1992 (10 ref, Eng).

The aerial parts of *P.hieracioides* ssp. *hieracioides* afforded jacquinelin (8-deoxy-11beta,13-dihydrolactucin. The roots yielded 11beta,13-dihydroglucozaluzanin C(2) which was isolated for the first time from the plants of this genus. The 1H-NMR spectra of 1 and its acetate 1a closely resembled those in the literature although many signals of the latter measured at 90 or 100 MHz were overlapping multiplets. Since the melting points of 1 and 1a were higher than those reported previously, the 1H-NMR spectrum of 1a recorded at 300 MHz was analysed. It is interesting to point out that the lactucin- and zaluzanin C-type guaianolides as 1 and 2, respectively coexist in this plant.

9204-2493 Kitanov, G.M., Spassov, S.L.(Department of Pharmacognosy, Faculty of Pharmacy, Institute of Pharmacology and Pharmacy, Dunav St. 2,1000 Sofia, Bulgaria) **A naphthodipyranodione from *Gentiana asclepiadea*.** *Phytochemistry*, v. 31(3): p. 1067-1068, 1992 (11 ref, Eng).

A new natural compound, 3,4-dihydro-1H,6H,8H-naphtho 1,2-c;4,5-c',d' dipyrano-1,8-dione, has been isolated from the roots of *G.asclepiadea*. The structure was established on the basis of spectroscopic studies.

9204-2494 Kobayashi, M., Ishida, K. , Terabayashi, S., Mitsuhashi, H.(Faculty of Pharmaceutical Sciences, Hokkaido, Kita-ku, Sapporo 060, Japan) **10-Hydroxypheophytins and a new norlabdane diterpene from the leaves of *Cupressus funebris* Endl.** *Chemical & Pharmaceutical Bulletin*, v. 39(12): p. 3348-3349, 1991 (17 ref, Eng).

The leaves of *C.funebris* were shown to contain four chlorophyll-derived pigments (2-5a), together with a new natural norlabdane-type diterpene 1a. Compounds 1a and 5a were isolated as methyl esters 1b and 5b. The pigments were identified as pheophytin a, 10-S- and 10R-hydroxypheophytin a and methyl pheophorbide a from spectroscopic analysis.

9204-2495 Kohda, H., Tanaka, S., Yamaoka, Y. , Ohhara, Y. (Institute of Pharmaceutical Sciences, Hiroshima University School of Medicine, Kasumi, Minami-ku, Hiroshima 734, Japan) **Saponins from *Amaranthus hypochondriacus*.** *Chemical & Pharmaceutical Bulletin*, v. 39(10): p. 2609-2612, 1991 (15 ref, Eng).

Four triterpenoid saponins were isolated from *A.hypochondriacus*. Their structures were elucidated based on spectral evidence to be: (1) 3-O-alpha-L-rhamnopyranosyl (1-3)-beta-D-glucuronopyranosyl-2beta, 3beta-dihydroxyolean-12-en-28-oic acid 28-O-beta-D-glucopyranosyl ester, (2) 3-O-alpha-L-rhamnopyranosyl (1-3)-beta-D-glucuronopyranosyl-2beta, 3beta-dihydroxyolean-12-en-23-al-28-oic acid 28-O-beta-D-glucopyranosyl ester; (3) 3-O-alpha-L-rhamnopyranosyl (1-3)-beta-D-glucuronopyranosyl-2beta, 3beta-dihydroxy-3-norolean-12,2 0(29)-dien-28-oic acid 28-O-beta-D-glucopyranosyl ester. (4) 3-O-alpha-L-rhamnopyranosyl (1-3)-beta-D-glucuronopyranosyl-2beta, 3beta-dihydroxy-30-norolean-12, 20(29)-dien-23-al-28-oic acid 28-O-beta-D-glucopyranosyl ester.

9204-2496 Kouno, I., Morisaki, T., Hara, Y. , Yang, C.S.(Faculty of Pharmaceutical Sciences, Nagasaki University, Bunkyo-machi 1-14, Nagasaki 852, Japan) **Two new sesquineolignans from the bark of *Illicium dunnianum*.** *Chemical & Pharmaceutical Bulletin*, v. 39(10): p. 2606-2608, 1991 (7 ref, Eng).

Two new sesquineolignans, named dunnianol (1) and isodunnianol (2), were isolated from the bark of *I.dunnianum* together with the known biphenylneolignan, magnolol. The structures were elucidated by means of the detailed analysis of their 1H-and 13C-nuclear magnetic resonance spectra of 1,2, and their acetylation and methylation products, including two-dimensional NMR spectra, comparing with those of magnolol, isomagnolol and macranthol, previously isolated from the same genus.

9204-2497 Kudou, S., Fleury, Y., Welti, D. , Magnolato, D., Uchida, T., Kitamura, K. , Okubo, K.(Kanessa Miso Co., Ltd., 202 Hamada, Tamagawa, Aomori 030, Japan) **Malonyl isoflavone glycosides in soybean seeds (Glycine max Merrill).** *Agricultural and Biological Chemistry*, v. 55(9): p. 2227-2233, 1991 (21 ref, Eng).

The isoflavone constituents in soybean seeds were investigated, and 9 kinds of isoflavone glycosides were isolated from the hypocotyls of soybean seeds. Three kinds were proved to be malonylated soybean isoflavones named 6"-O-malonyldaidzin, 6"-O-malonylglycitin and 6"-O-malonylgenistin by UV,MS,IR and NMR. The malonylated isoflavone glycosides as major isoflavone constituents in soybean seed were thermally unstable, and were converted into their corresponding isoflavone glycosides. All of the isoflavone components produced intensely undesirable taste effects such as bitter, astringent and dry mouth feelings.

9204-2498 Kwon, Y.S., Woo, E.R.* , Kim, C.M.(Korea Institute of Science & Technology, Seoul, 131, Korea) **A**

study on the constituents of bioactive fractions of *Ostericum koreanum* Kitagawa. *Korean Journal of Pharmacognosy*, v. 22(3): p. 156-161, 1992 (15 ref, Kor, Eng).

Four furocoumarins and two dihydrofuranocoumarin glycosides have been isolated from the benzene-soluble and butanol-soluble portions of the roots of *O.koreanum* respectively. Four furocoumarins have been determined as imperatorin, isoimperatorin, oxypeucedanin and oxypeucedanin hydrate, and two dihydrofuranocoumarin glycosides determined as marmesinin and 4'-O-beta-D-glucopyranosyl-3'-hydroxymarmesin on the basis of spectral data and physico-chemical evidence.

9204-2499 Lamaty, G., Menut, C., Hassani, M.S., Bessiere, J.M., Doukhan, G. (Laboratoire de Chimie Organique Physique Universite de Montpellier II, Sciences et Techniques du Languedoc 34095 Montpellier Cedex 5, France) **Phenylbutane derivatives as main constituents of *Monanthotaxis capea* essential oil.** *Journal of Essential Oil Research*, v. 4(1): p. 33-39, 1992 (34 ref, Eng).

The essential oil of *M.capea* was analyzed by GC/MS. (E)- and (Z)-4-phenylbut-3-en-2-ol and their acetates were found to represent about 85 percent of the whole oil. It is the first time that these compounds have been found in such abundance in an essential oil. A biosynthetic pathway of these phenylbutane derivatives is proposed.

9204-2500 Lawrence, B.M. (RJR Tobacco Company, Bowman Gray Technical Centre, P.O.Box 2959, Winston-Salem, North Carolina 27102, USA) **Progress in essential oils.** *Perfumer & Flavorist*, v. 17(2): p. 39-52, 1992 (35 ref, Eng).

Recent development made in the chemistry of essential oils of *Artemisia absinthium*, *Foeniculum vulgare*, *Pelargonium graveolens*, star anise and *Pistacia lentiscus* have been reviewed.

9204-2501 Lee, K.R. (College of Pharmacy, Sung Kyun Kwan University, Suwon 440-746, Korea) **Peroxide constituents in the natural product research.** *Korean Journal of Pharmacognosy*, v. 22(3): p. 145-155, 1991 (Kor, Eng).

Nearly 300 peroxides have been isolated and structurally characterized from natural sources, mainly as constituents of compositae and marine sponge, and occur randomly in about 10 other plant families. Among peroxides studied, sesquiterpene endoperoxide, quinquaosu, has been already clinically applied as a new antimalarial drug. Based on the peroxides reported, structural classification, natural distribution and biological and pharmacological activities

are reviewed. Color reagent and spectroscopic identification of peroxides are also described.

9204-2502 Lewin, G., Menez, P.L.E., Renouard, A., Giesen-Crouse, E. (Laboratoire de Chimie des substances Therapeutiques Naturelles, Centre d'Etudes Pharmaceutiques, Chatenay-Malabry 92296, Cedex, France) **Akuammine and dihydroakuammine, two indolomonoterpene alkaloids displaying affinity for opioid receptors.** *Journal of Natural Products*, v. 55(3): p. 380-384, 1992 (19 ref, Eng).

Akuammine {1}, an indolomonoterpene alkaloid, which is the major components of the seeds of *P.nitida*, was reduced to dihydroakuammine {4}. This compound has structural analogy with eseroline, for which affinity for opiate receptors was reported. The present investigation showed that 1 and 4 also bind (with lower affinity however) to mu and k opiate receptors. ¹H- and ¹³C-nmr spectra of 1 and 4 have been fully assigned by 2D nmr experiments.

9204-2503 Lichius, J.L., Melzheimer, V., Wichtl, M.* (Institut fur Pharmazeutische Biologie der Philipps-Universitat Marburg, Deutschhausstr. 17 D(W)-3550 Marburg/L., Federal Republic of Germany) **Comparative investigations of the cardenolide pattern of four varieties of *Digitalis subalpina* Br.-Bl..** *Planta Medica*, v. 58(1): p. 102-104, 1992 (8 ref, Eng, Ger).

No remarkable differences in the cardenolide pattern of the four varieties of *D.subalpina* could be found. Subalpinoside (Oleandrinogenin-glucodigitoxoside) is the main cardiac glycoside in all varieties.

9204-2504 Lin, Y.L., Chen, Y.L., Kuo, Y.H. (National Research Institute of Chinese Medicine, Taipei Hsien, Taiwan ROC) **Three new flavonoids, 3'-methoxylupinifolin, laxifolin, and isolaxifolin from the roots of *Derris laxiflora* Benth.** *Chemical & Pharmaceutical Bulletin*, v. 39(12): p.3132-3135, 1991 (15 ref, Eng).

The following constituents were isolated from the roots of *D.laxiflora* stemichapparin-B (1), 3'-methoxylupinifolin (2a), lupinifolin (2b), beta-amyrin (3), lupeol (4), prunetin (5), laxifolin (6a), and isolaxifolin (7a). Compounds 2a, 6a and 7a are new flavonoids, and their structures were determined on the basis of spectral and chemical evidence.

9204-2505 Liu, B.C., Fang, J.N. (Shanghai Institute of Materia Medica, Academia Sinica, Shanghai 200031) **Isolation, purification and chemical structure of a glucan from *Glycyrrhiza uralensis* Fisch.** *Acta Pharmaceutica Sinica*, v. 26(9): p. 672-675, 1991 (13 ref, Jap, Eng).

A glucan, GBW, was isolated from the alkaline aqueous extract of *G. uralensis*. Its mean molecular weight was estimated to be 4×103 . TLC, methylation analysis, periodate oxidation, Smith degradation, partial acid hydrolysis, KI-I₂ reaction, IR and ¹³CNMR showed that GBW is a (1 to 4) linked alpha-D-glucan-6.

9204-2506 Liu, J.S., Zhou, H.X., Li, L. (Synphar Laboratory Inc., 4290-91A Street, Edmonton, Alberta, Canada T6E 5V2) **Kadsulignans H, I, J and K from a Kadsura species.** *Phytochemistry*, v. 31(4): p. 1379-1382, 1992 (5 ref, Eng).

Four new lignans, kadsulignan H,I,J and K were isolated from the seeds of a *Kadsura* sp., of which kadsulignan K possesses a novel benzobicyclooctane skeleton. Their structures, including absolute configurations were elucidated by 2D ¹H-¹³C long range COSY spectra and chemical conversions.

9204-2507 Liu, S.L., Wei, L.X., Wang, D.* , Gao, C.Y. (Beijing College of Traditional Chinese Medicine, Beijing 10071, China) **Studies on the chemical constituents from the peel of *Zanthoxylum schinifolium* Sieb et Zucc.** *Acta Pharmaceutica Sinica*, v. 26(11): p. 8326-840 , 1991 (8 ref, Eng, Jap).

Five compounds have been isolated from the Chinese traditional drug *Qinghuajiao Z.schinifolium*. On the basis of UV,IR,¹HNMR, ¹H-¹H COSY, ¹H-¹³C COSY, NOESY and MS spectroscopic analysis, four of them have been identified as bergapten (I), umbelliferone (II), skimmianine (III) and schinifoline (IV) respectively. The compounds II, III and IV were obtained for the first time from this species and the last one is a new compound.

9204-2508 Loayza, I., Deslauriers, H., Jean, F.I., Collin, G.J. (Laboratoire d'Analyse et de Separation des Essences Vegetales Universite du Quebec a Chicoutimi Chicoutmi, Quebec G7H 2B1, Canada) **Volatile constituents of the essential oils of *Lepidophyllum quadrangulare* (Meyen) Benth. and Hook.** *Journal of Essential Oil Research*, v. 4(1): p. 83-85 , 1992 (4 ref, Eng).

The essential oil of *L.quadrangulare* (Local name: Tola enaua) was analyzed by a combination of GC/MS. The oil was found to contain 67 constituents of which 37 were identified. The major compounds were alpha-pinene (17-19 percent) and beta-pinene (11-13 percent), and a variety of sesquiterpenes and such as delta-cadinene (8-10 percent), gamma-2-cadinene (1.4-1.7 percent), gamma-cadinene (0.6-0.7 percent) and alpha-muurolene (2.0-2.3 percent).

9204-2509 Lohar, D.R., Chaturvedi, D., Varma, P.N. (Pharmaceutical Chemistry Division, Homoeopathic

Pharmacopoeia Laboratory, Central Govt. Office Building, Ghaziabad 201002, UP, India) **Mineral elements of a few medicinally important plants.** *Indian Drugs*, v. 29(6): p. 271-273, 1992 (4 ref, Eng).

Mineral contents present in *Acorus calamus*, *Asparagus racemosus*, *Calotropis procera*, *Cissampelos pareira*, *Cyperus rotundus*, *Desmodium gangeticum*, *Nardostachys jatamansi*, *Picrorrhiza kurroa*, *Plumbago zeylanica* and *Withania somnifera* have been reported.

9204-2510 Lou, Z., Gao, C., Lin, F. , Zhang, J., Lin, M., Sharaf, M., Wong, L., Slatkin, D., Schiff, P.L.* (Department of Pharmaceutical Sciences, School of Pharmacy, University of Pittsburgh, Pittsburgh, PA 15261, USA) **Alkaloids of *Thalictrum glandulosissimum*.** *Planta Medica*, v. 58(1): p. 114, 1992 (4 ref, Eng).

Extensive gradient column chromatography and preparative TLC of the non-quaternary alkaloid fractions of rhizomes of *T.glandulosissimum* afforded alkaloids viz., the protopine alkaloids cryptopine (62mg) and protopine (35mg); the bisbenzylisoquinoline alkaloids (+)-hernandezine (38mg) and (+)-thalidezine (32mg); the protoberberine alkaloids 8-oxocoptisine (22mg) and berberine (8mg); and the possibly artefactual ketolactam (+)-puntarenine (18mg) (2). The alkaloids were identified by direct comparison (UV,IR,¹H-NMR,EIMS,m.p., optical activity) with authentic samples and /or published data.

9204-2511 Ma, W.G., Wang, D.Z., Zeng, Y.L. , Yang, C.R.* (Laboratory of Phytochemistry, Kunming Institute of Botany, Chinese Academy of Sciences, Kunming 650204, China) **Triterpenoid saponins from *Triplostegia grandiflora*.** *Phytochemistry*, v. 31(4): p. 1343-1347, 1992 (8 ref, Eng).

Four new oleanane triterpenoid saponins named triplosides D-G were isolated from the roots of *T.grandiflora* and their structures elucidated on the basis of chemical degradation and spectral evidence. All of them have a common aglycone and are monodesmosides.

9204-2512 Madrigal Peralta, D., Cuevas Acuna, C.(Instituto Technologico de Oaxaca, Centro de Graduados e Investigacion, Calzs. Technologico y W. Massieu s/n, 68030 Oaxaca, Oaxac.Mexico) **Identification of steroids in *Agave angustifolia* Haw..** *Revista Latinoamericana de Quimica*, v. 22(4)+23(1): p. 28-30, 1992 (7 ref, Spa, Eng).

Hecogenin, tigogenin and dehydrohecogenin have been isolated from the leaves of *A.angustifolia* and their ¹H and ¹³C NMR data reported.

9204-2513 Maillard, M., Adewunmi, C.O. , Hostettmann, K.(Institut de Pharmacognosie et Phytochimie, Universite

de Lausanne, BEP, CH-1015 Lausanne, Switzerland) **Triterpene glycoside from the fruits of *Tetrapleura tetraptera*.** *Phytochemistry*, v. 31(4): p. 1321-1323, 1992 (14 ref, Eng).

A new saponin has been isolated from the molluscicidal extract of the fruits of *T.tetraptera*. Chemical enzymatic and spectral methods (D/CIMS, 1H, 13C NMR) showed that it was a monodesmosidic diglycoside of the rare sapogenin 27-hydroxyolean-12(13)-en-28-oic acid.

9204-2514 Mallavarapu, G.R., Ramesh, S., Kulkarni, R.N., Syamasundar, K.V. (Central Institute of Medicinal and Aromatic Plants Regional Centre, Bangalore 560 065, Karnataka, India) **Composition of the essential oil of *Cymbopogon travancorensis*.** *Planta Medica*, v. 58(2): p.219-222, 1992 (20 ref, Eng).

The chemical composition of the essential oil of *C.travancorensis* was investigated by capillary GC and GC and MS. Thirty-five compounds were identified. The oil contains mono- and sesquiterpene hydrocarbons (39.60 percent), oxygenated terpenes (30.35 percent) and phenyl propanoids (22.04 percent). The main constituents of the oil are camphene (11.86 percent), limonene (18.07 percent), borneol (9.71 percent), elemicin (17.22 percent) and elemol (11.21 percent).

9204-2515 Manalo, G.D. (18 Mallindog St. U.P.Village, Quezon City, Philippines 1101) **Recent studies on Alstonia alkaloids.** *7th Asian Symposium on Med. Plants, Spices and Other Natural Prod. (ASOMPS VII). Manila, 2-7 February 1992* (Eng).

Lagunamine (19-hydroxytubo-taiwine), angustilobine B acid and losbonine (7-seco-6-nor-angustilobine B) were obtained from the leaves and 17-O-acetylechitamine together with echitamine were isolated from the bark of *A.scholaris*. Preliminary studies on the flowers of *A.macrophylla* have been reported. B)Abstr.No. WP-5B)%B).

9204-2516 Manalo, G.D.* (18 Maalindog St. UP Village, Quezon City, Philippines 1101) **Flavonoids in medicinal plants.** *7th Asian Symposium on Med. Plants, Spices and Other Natural Prod. (ASOMPS VII). Manila, 2-7 February 1992* (2 ref, Eng).

Casticin, chrysophenol D and isoorientin were isolated from two pharmacologically active (bronchial relaxant) fractions of the extract of the leaves of *Vitex negundo*. (Abstr. No. WP-5A).

9204-2517 Manns, D., Hartmann, R. (Pharmazeutisches Institut der Universitat Bonn, Kreuzbergweg 26, D 5300 Bonn 1., Germany) **Annuadiepoxide, a new polyacetylene from**

the aerial parts of *Artemisia annua*. *Journal of Natural Products*, v. 55(1): p. 29-32, 1992 (8 ref, Eng).

The aerial parts of *Artemisia annua* afforded a new highly unstable polyacetylene named annuadiepoxide as well as the known polyacetylene ponticaepoxide. The structures were elucidated by high field NMR techniques.

9204-2518 Markham, K.P., Geiger, H., Jaggy, H. (DSIR-Chemistry, Private Bag, Petone, New Zealand) **Kaempferol-3-O-glucosyl (1-2) rhamnoside from *Ginkgo biloba* and a reappraisal of other gluco (1-2, 1-3 and 1-4) rhamnoside structures.** *Phytochemistry*, v. 31(3): p. 1009-1011, 1992 (13 ref, Eng).

A kaempferol-3-O-glucorhamnoside from *G.biloba* is defined as the 3-O-alpha-L (beta-D-glucopyranosyl (1-2) rhamnopyranoside) on the basis of 2D NMR evidence. The NMR distinctions of 1-2, 1-3 and 1-4 linked glucopyranosylrhamnopyranosides are discussed.

9204-2519 Massiot, G., Boumendjel, A., Nuzillard, J.M., Richard, B., Men-Olivier, L.L., David, B., Hadi, h.A. (Faculte de Pharmacie, Laboratoire de Pharmacognosie, URA au CNRS No. 492, 51 Rue Cognacq-Jay 51096 Reims Cedex, France) **Alkaloids from *Alstonia undulifolia*.** *Phytochemistry*, v. 31(3): p. 1078-1079, 1992 (8 ref, Eng).

(+)-Tetrahydrocantleyine, (-)-cantleyine, (-)-akuamidine, pleiocarpamine, echitamidine, 20-epi-19gamma-echitamidine, echitamine, nor-echitamine and undulifoline, a new alkaloid with the rare uleine skeleton, have been isolated from the stem bark of *A.undulifolia*. The structures were established by spectroscopic means.

9204-2520 Masuda, T., Muroya, Y., Nakatani, N. (Laboratory of Food Chemistry, Faculty of Science of Living, Osaka City University, Sumiyoshi, Osaka 558, Japan) **7-Hydroxycoumarin derivatives from the juice oil of *Citrus hassaku*.** *Phytochemistry*, v. 31(4): p. 1363-1366, 1992 (4 ref, Eng).

Three new 7-hydroxycoumarin derivatives have been isolated from the juice oil of whole fruits of *C.hassaku*, and their structures determined to be 7-(6R-hydroxy-3,7-dimethyl-2E,7-octadienyloxy) coumarin, (+)-7-hydroxy-6-linalylcoumarin and (R)-6-O-(4-geranyloxy-2-hydroxy) cinnamoylmarmin by spectral data and chemical evidence.

9204-2521 Matlawska, I. (Katedra i Zaklad Farmakognozji, Akademia Medyczna, im.k. Marcinkowskiego, ul. Sieroka 10,61-771 Poznan, Polska) **Investigation of flavonoid compounds of selected species from Malvaceae family.**

Herba Polonica, v. 36(3): p. 65-69, 1990 (Recd. 1992, 19 ref, Pol, Eng).

Flavonoids were detected chromatographically in leaves and flowers of 34 species of Malvaceae. Kaempferol and quercetin are predominant, and luteolin, apigenin and chrysoeriol less common in flowers. Hypolaetin and gossypetin were the most common in leaves.

9204-2522 Matlowska, I.(Katedra i Zaklad Farmakognozii, Akademia Medyczna, ul. Sieroca 10, 61-771 Poznan, Polska) **Flavonoid compounds from leaves of *Kitaibelia vitifolia* (Malvaceae).** *Herba Polonica*, v. 36(3): p. 71-76, 1990 (Recd. 1992, 19 ref, Pol, Eng).

Apigenin, chrysoeriol, luteolin, their 7-O-glycosides, apigenin 7-O-diglucoside, kaempferol 3-O-glucoside and 3-O-rutinoside, quercetin 3-O-glucoside and 3-O-rutinoside have been isolated from the leaves of *K.vitifolia* and identified.

9204-2523 Mehri, H., Plat, M.* (Universite de Paris-Sud, Faculte de Pharmacie, Laboratoire de Chimie therapeutique II (S.D.I. 62330 au C.N.R.S.), rue J.B. Clement, F92296 Chatenay-Malabry Cedex, France) **Structure of scandomelidine, bisindole alkaloid from *Melodinus scandens*.** *Journal of Natural Products*, v. 55(2): p. 241-244, 1992 (27 ref, Eng).

Scandomelidine (42H46N4O5) is one of the five quasi-dimeric alkaloids isolated from stems and leaves of *M.scandens*. Its structure was established on the basis of spectroscopic evidence and results from the coupling of venalstonine to pachysiphine by a 10,3' bond.

9204-2524 Messanga, B.B., Tih, R.G., Kimbu, S.F., Sondengam, B.L., Martin, M.T., Bodo, B (Department of Organic Chemistry, University of Yaounde, P.O.Box 812, Yaounde, Cameroon) **Calodenone, a new isobiflavonoid from *Ochna calodendron*.** *Journal of Natural Products*, v. 55(2): p. 245-248, 1992 (12 ref, Eng).

The MeOH extract of the stem bark of *O.calodendron* has furnished a new biflavonoid, calodenone (C31H24O8), the structure of which has been established from spectroscopic and chemical evidence.

9204-2525 Michael, J.P. (Centre for Molecular Design, Department of Chemistry, University of the Witwatersrand, Wits 2050, South Africa) **Indolizidine and quinolizidine alkaloids.** *Natural Product Reports*, v. 8(6): p. 553-572, 1991 (140 ref, Eng).

Literature on indolizidine and quinolizidine alkaloids, published between July 1989 and June 1990 has been reviewed.

9204-2526 Mitsunaga, K., Koike, K., Fukuda, H., Ishii, K., Ohmoto, T. (School of Pharmaceutical Sciences, Toho University, 2-2-1, Miyama, Funabashi, Chiba 274, Japan) **Ligustrinoside, a new bisiridoid glucoside from *Strychnos ligustrina*.** *Chemical & Pharmaceutical Bulletin*, v. 39(10): p. 2737-2738, 1991 (4 ref, Eng).

A new bisiridoid glucoside, ligustrinoside (1), along with three known iridoids, loganin, loganetin and loganic acid were isolated from the wood of *S.ligustrina* collected in Indonesia. The structure of ligustrinoide (1) has been determined as an ester dimer of loganin and loganic acid between C-7 and C-11.

9204-2527 Miyase, T., Iwata, Y., Ueno, A. (School of Pharmaceutical Sciences, University of Shizuoka, 395, Yada, Shizuoka 422, Japan) **Tenuifolioses A-F, oligosaccharide multi-esters from the roots of *Polygala tenuifolia* Willd..** *Chemical & Pharmaceutical Bulletin*, v. 39(11): p. 3082-3084, 1991 (4 ref, Eng).

From the roots of *P.tenuifolia* six new oligosaccharides, named tenuifolioses A-F, were isolated and their structures were elucidated by spectroscopic data and chemical evidence. These oligosaccharides were esterified with acetic, benzoic, p-coumaric and ferulic acid.

9204-2528 Miyase, T.* , Akahori, C., Kohsaka, H., Ueno, A. (School of Pharmaceutical Sciences, University of Shizuoka, 395, Yada, Shizuoka 422, Japan) **Acylated iridoid glycosides from *Buddleja japonica* Hemsl..** *Chemical & Pharmaceutical Bulletin*, v. 39(11): p. 2944-2951, 1991 (9 ref, Eng).

Sixteen new acylated iridoid glycosides, called budlejosides A1-A16, were isolated from *B.japonica*, together with four known iridoid glycosides; 6-vanillyl-ajugol, 6-feruloyl-ajugol, verbascoside A, and 6-O- {alpha-L-(4-O-feruloyl)-rhamnopyranosyl}-cafalpol. Structures of the new compounds were determined on the basis of chemical and spectroscopic evidence. Budlejosides A1 was an ajugol derivative acylated with monoterpenic acid, A2 was an sinuatal and A3-A16 were 6-rhamnopyranosyl-catalpol derivatives acylated with cinnamic acid derivative and acetic acid.

9204-2529 Miyazaki, K., Ishizawa, S., Nagumo, S., Inoue, T., Nagai, M. (Faculty of Pharmaceutical Sciences, Hoshi University, Tokyo 142, Japan) **Studies on the constituents of Aceraceae plants, IX. Constituents of *Acer cissifolium*.** *Shoyakugan Zasshi*, v. 45(4): p. 333-335, 1991 (6 ref, Eng).

Five flavonoids, quercetin, quercitrin, isoquercitrin, kaempferol and aszelin, and three aromatic carboxylates, methyl gallate, methyl chlorogenate and geraniin were iso-

lated from the leaves of *A.cissifolium* in addition to fridelan-3beta-ol acetate.

9204-2530 Mondon, J.M., Pieribattesti, J.C., Gaydon, E.M. (Laboratoire d'Agrochimie et du Service de la Repression des Fraudes-Faculte des Sciences-Universite de La Reunion-BP 5-97490 Sainte-Clotilde-France) **Identification of volatile constituents from Apium leptophyllum.** 7th Asian Symposium on Med. Plants, Spices, and Other Natural Prod. (ASOMPS VII). Manila, 2-7 February 1992 (Eng).

The aerial part of *A.leptophyllum* afforded an essential oil (0.45 percent) containing 68 percent of p-cymene derivatives. An oxygenated product (36.2 percent) was identified as thymohydroquinone dimethylether on the basis of their ^1H , ^{13}C NMR and MS spectra. Methyl thymol (11.7 percent), methyl carvacrol (5.9 percent), p.cymene (15 percent) and gamma-terpinene (22 percent) were the other main components. The chemical composition of the oil of the leaves and stems is compared with root oil and fruit oil. (Abstr. No. MP-8A).

9204-2531 Morfaux, A.M., Mouton, P., Massiot, G., Men-Olivier, I.L. (Faculte de Pharmacie (URA au CNRS No. 492), 51, Rue Cognacq-Jay, 51096 Reims Cedex, France) **Alkaloids from Tonduzia pittieri.** *Phytochemistry*, v. 31(3): p. 1079-1082, 1992 (6 ref, Eng).

From the leaves of *T.pittieri* (*Alstonia pittieri*), nine alkaloids have been identified. Four are novel: 11-methoxyvincamedine, 11-{10-(11-methoxy-17-epi-vincamajinyl)}-vincorine, 11-{10-(11-methoxyvincamajinyl)}-vincorine, 11-{10-(11-methoxyvincamedinyl)}-vincorine. The five others are known: vincorine, 11-methoxy-17-epi-vincamajine, picrinine, 18-hydroxycabucraline and cabufiline.

9204-2532 Mu, Q.Z., Shen, Y.M.*., Zhou, Q.L., Wang, S.Q., Wu, B., Zheng, Q.T. (Laboratory of Phytochemistry, Kunming Institute of Botany, Academia Sinica, Kunming 650204, Yunnan, People's Republic of China) **Studies on the constituents of Adelostemma gracillimum.** *Planta Medica*, v. 58(2): p. 200-204, 1992 (14 ref, Eng).

The glycone portion of the glycoside of *A.gracillimum* was investigated. Three known polyoxypregnane ester-type aglycones, penupogenin, kidjoranine and gagamine and one new compound named gracigenin were isolated and their structures were characterized on the basis of spectroscopic evidence, and that of gracigenin was determined by X-ray crystallography. It was found to possess an unprecedented 8,14-seco-polyoxypregnane ester-type skeleton and it is the first compound with this C21-steroid type skeleton to be found in nature.

9204-2533 Mukherjee, K.S., Laha, S., Chakraborty, C.K. (Department of Chemistry, Visva-Bharati, Santiniketan 731235, WB, India) **Phytochemical investigation of Hemigraphis hirta T Anders and Jussiaea repens Linn.** *Journal of the Indian Chemical Society*, v. 68(11): p. 634-635, 1991 (5 ref, Eng).

Stigmasterol and n-hentriacontanol have been isolated from the whole plant of *H.hirta*. Petroleum ether extract of *J.repens* yielded ursolic acid.

9204-2534 Murai, F., Tagawa, M., Ohishi, H. (Laboratory of Chemistry, Aichi Medical University, 21 Karimata, Yazago, Nagakute-cho, Aichi-gun, Aichi 480-11 Japan) **Absolute structure of kiwiionoside as a precursor of loliolide and actinidiolide from Actinidia chinensis.** *Planta Medica*, v. 58(1): p. 112-113, 1992 (5 ref, Eng).

The fresh leaves of *A.chinensis* (kiwi fruit) were examined a new glucoside (1) named kiwiionoside, was isolated. The complete structure and stereochemistry of (1) were established unequivocally by a single-crystal X-ray analysis of the (kiwiionoside penta acetate. The absolute structure of (1) was determined through the above result by taking account of the absolute chemistry of the D-glucose moiety. (2) In addition, loliolide, and actinidiolide were produced from (1) by allyl rearrangement or concomitantly by enzymatic hydrolysis.

9204-2535 Muyard, F., Bevalot, F., Laude, B., Vaquette, J. (Laboratoire de Pharmacognosie, Faculte de Medecine et Pharmacie, Place St Jacques, 25030 Besancon, France) **Alkaloids from stem bark of Dutaillyea baudouinii.** *Phytochemistry*, v. 31(3): p. 1087-1089, 1992 (10 ref, Eng).

The stem bark of *D.baudouinii* yielded five quinolines. Two were the known furoquinolines, evoxine and haplopine, two were new dihydrofuroquinolines, 7,8-dimethoxyplatydesmine and 7,8-dimethoxymyrtopsine, and one was a new dihydropyranoquinoline, 8,9-dimethoxygeibalansine.

9204-2536 Nahar, N., Aman, A.M., Mosihuzzaman, M. (Department of Chemistry, University of Dhaka, Dhaka 1000, Bangladesh) **Isolation and characterization of some terpenoids and phenolic acids of Abroma augusta root bark.** 7th Asian Symposium on Med. Plants, Spices and Other Natural Prod. (ASOMPS VII). Manila, 2-7 February 1992 (Eng).

A.augsta is reported to contain anti-fertility agent. The mucilages of stem and root bark were studied. A triterpene and a triterpenic acid were isolated from chloroform extract of the root bark. A terpenoid glycoside was isolated from methanol extract of the root bark. The structure of the

glycoside was determined by chemical and spectroscopic methods. (Abstr. No. WP-2).

9204-2537 Nakanishi, T., Konishi, M., Murata, H., Inada, A., Fujii, A., Tanaka, N., Fujiwara, T. (Faculty of Pharmaceutical Sciences, Setsunan University, "Hirakata, Osaka 573-01, Japan) **Phytochemical studies on Meliaceous plants. VII. The structures of two new ionone glucosides from *Melia toosendan* Sieb. et Zucc. and a novel type of selective biooxidation by a kind of protease.** *Chemical & Pharmaceutical Bulletin*, v. 39(10): p. 2529-2533, 1991 (10 ref, Eng).

Two new ionone glucosides, melia-ionosides A and B, were isolated from leaves of *M. toosendan* and their structures were elucidated based on combinations of chemical, spectral, and X-ray analytical studies. In addition, a novel type of selective bio-oxidation by a kind of protease (Molsin) was found during the course of the structural elucidation.

9204-2538 Nema, D., Srivastava, S.K., Srivastava, S.D. (Department of Chemistry, Dr. H.S. Gour Vishwavidyalaya, Sagar 470003, MP, India) **Chemical examination of the stem bark of *Diospyros discolor*.** *Journal of The Indian Chemical Society*, v. 68(8): p. 477-478, 1991 (8 ref, Eng).

Air dried powdered stem bark yielded a sterol, stigmasta-5,6-dihydro 22-en-3 β -ol. along with betulinic acid.

9204-2539 Nonato, M.G., Garson, M.J., Truscott, R.J.W. (Department of Chemistry, University of Wollongong P.O.Box 1144, Northfields Avenue, Wollongong N.S.W., Australia 2500) **Glucoindole alkaloids from a Philippine medicinal plant of the genus *Ophiorrhiza*.** *7th Asian Symposium on Med. Plants, Spices, and Other Natural Prod. (ASOMPS VII)*. Manila, 2-7 February 1992 (2 ref, Eng).

In the study of the distribution of alkaloid-bearing plants in the island of Palawan, southwest of Manila, a plant identified as belonging to the genus *Ophiorrhiza* of the family Rubiaceae gave a positive test with Mayers reagent. Ethnomedical information on this plant reveal that a decoction of the combined roots, leaves and bark is used for stomach aches while the leaves are used for dressing ulcers. Glucoindole type alkaloids related in structure to Iyalosidic acid and dolichantoside have been isolated from the leaves of *Ophiorrhiza* spp. (Abstr. No. MO-6).

9204-2540 Nonato, M.G., Garson, M.J., Truscott, R.J.W. (Department of Chemistry, University of Wollongong P.O.Box 1144, Northfields Avenue, Wollongong

N.S.W., Australia 2500) **Alkaloids of *Pandanus amaryllifolius*.** *7th Asian Symposium on Med. Plants, Spices, and Other Natural Prod. (ASOMPS VII)*. Manila, 2-7 February 1992 (1 ref, Eng).

Isolation and structure elucidation of pandamarine and other alkaloids from *P. amaryllifolius* has been described.

9204-2541 Noro, Y., Hisata, Y., Okuda, K., Kawamura, T., Tanaka, T., Nishibe, S. (Faculty of Pharmacy, Meijo University, Tenpaku, Nagoya 468, Japan) **Phenylethanoid glycosides in the fruits of *Forsythia* spp.** *Shoyakugaku Zasshi*, v. 45(4): p. 327-332, 1991 (9 ref, Jap, Eng).

Fruit of *Forsythia* spp. contain four phenylethanoid glycosides, forsythiaside (FOR), suspesaside (SUS); acetoside (ACT) and beta-hydroxyacetoside (beta-hydroxyACT). The phenylethanoid glycoside contents of the fruits of eight species of *Forsythia* were determined by HPLC. *Forsythia koreana* fruits contained FOR, SUS, ACT and beta-hydroxyACT. Young *F. suspensa* fruits contained FOR, SUS and ACT, whereas mature ones contained SUS, a decreased amount of FOR and no ACT. *F. vividissima* fruits contained neither FOR nor SUS. These results may be useful for the identification of the origins of commercial samples of the crude drug and of its dried extracts.

9204-2542 Noumbissie, B., Kapnang, H., Fomum, Z.T., Martin, M.T., Bodo, B. (Department of Organic Chemistry, Faculty of Science, University of Yaounde, BP 812, Yaounde, Cameroon) **Staudtienic acid, a diterpene acid from *Staudtia kamerunensis*.** *Journal of Natural Products*, v. 55(1): p. 137-139, 1992 (2 ref, Eng).

A new diterpene acid, staudtienic acid, (C₂₀H₂₆O₂; mp 155-56 degree C) has been isolated from *S. kamerunensis* and its structure has been determined from a spectroscopic study including ir, ms, and 1H and 13C nmr.

9204-2543 Omobuwajo, O.R., Adesanya, S.A., Babalola, G.O. (Department of Pharmacognosy, Faculty of Pharmacy; Faculty of Science, Obafemi Awolowo University, Ile-Ife, Nigeria) **Isoflavonoids from *Pycnanthus angolensis* and *Baphia nitida*.** *Phytochemistry*, v. 31(3): p. 1013-1014, 1992 (10 ref, Eng).

The heartwood of *P. angolensis* furnished a new isoflavone 7,4'-dimethoxy-2'-hydroxyisoflavone in addition to the known 2'-hydroxyformononetin, while that of *B. nitida* gave known isoflavonoids sativan and medicarpin.

9204-2544 Ono, M., Kawasaki, T., Miyahara, K.* (Faculty of Pharmaceutical Sciences, Setsunan University, 45-1 Nagaotoge-cho, Hirakata, Osaka 573-01, Japan) **Resin**

glycosides. XI. Operculins III,IV,IX,XVI,XVII and XVIII, new ether-soluble resin glycosides of rhizoma Jalapae Braziliensis (root of *Ipomoea operculata*). *Chemical & Pharmaceutical Bulletin*, v. 39(10): p. 2534-2539, 1991 (7 ref, Eng).

Ten ether-soluble resin glycosides (jalapins), operculins IX-XVIII, were isolated from rhizoma Jalapae Braziliensis (roots of *Ipomoea operculata*). Operculins III and IV previously obtained, and operculins IX,X,XVI,XVII and XVIII were characterized on the bases of chemical and spectral data. All of them have a common glycosidic acid, operculinic acid B, with a macrocyclic ester structure and n-decanoyl and/ or n-dodecanoyl residues as organic acid groups.

9204-2545 Onwuka, C.F.I.(Department of Animal Nutrition, College of Animal Science and Livestock Production, University of Agriculture, PMB 2240, Abeokuta, Ogun State, Nigeria) **Tannin and saponin contents of some tropical browse species fed to goats.** *Tropical Agriculture (Trinidad)*, v. 69(2): p. 176-180 , 1992 (22 ref, Eng).

Leaves of 37 browse species were assayed for their contents of tannin and saponin as possible anti-nutritional factors in livestock feeding. The tannin contents of leaves and trees and herbs were found to be higher than those of shrubs. Ranges of tannin in these plants were 0.09-4.00; 0.03-1.30 and 0.19-3.28 percent in the trees, shrubs and herbs respectively. The corresponding ranges for the saponin were 0.07-0.89, 0.002-0.19 and 0.11-0.36 percent. Feeding of leaves of *Gliricidia sapum*, *Manihot esculenta* and *Spondias mombin* to goats significantly influenced the dry matter intake, nitrogen intake and nitrogen balance in the animals. However, body weight gain was not affected.

9204-2546 Oobayashi, K., Yoshikawa, K. , Arihara, S.(Faculty of Pharmaceutical Sciences, Tokushima-Bunri University, Tokushima, Tokushima, 770, Japan) **Structural revision of bryonoside and structure elucidation of minor saponins from *Bryonia dioica*.** *Phytochemistry*, v. 31(3): p. 943-846, 1992 (11 ref, Eng).

The structure of bryonoside, which has previously been isolated from the roots of *B.dioica*, has been revised. In addition, three new cucurbitacin saponins, named brydioside A, B and C have also been obtained. Their structures were established on the basis of spectral and chemical evidence.

9204-2547 Ozek, T., Kirimer, N., Baser, K.H.C.(Anadolu University Medicinal Plants Research Centre, 26470 Eskisehir, Turkey) **Composition of the essential oil of *Micromeria myrtifolia* Boiss.et Hohen.** *Journal of Essential Oil Research*, v. 4(1): p. 79-80 , 1992 (1 ref, Eng).

Water distilled essential oil of *M.myrtifolia* (Dagcayi, Topukcayi, Haydarotu) was examined by GC/MS. Forty-six constituents were characterized. beta-Caryophyllene (42.56 percent) was the main component of the oil.

9204-2548 Pachaly, P., Adnan, A.Z., Will, G.(Pharmazeutisches Institut der Universitat Bonn, Kreuzbergweg 26, D(W)-5300 Bonn, Federal Republic of Germany) **NMR-Assignments of N-acylaporphine alkaloids from *Tinospora crispa*.** *Planta Medica*, v. 58(2): p. 184-187, 1992 (6 ref, Eng).

N-Formylannonaine, N-formylnornuciferine and N-acetylnornuciferin, have been isolated from stems of *T.crispa* and their NMR-spectra have been fully assigned by 2D-NMR experiments. This is the first reported occurrence of N-formyl-and N-acetylaporphines from the genus *Tinospora*.

9204-2549 Padmakumari, K.P., Narayanan, C.S.(Regional Research Laboratory, CSIR Thiruvananthapuram 695019, Kerala, India) **Volatile constituents of *Litsea zeylanica* leaf oil.** *Journal of Essential Oil Research*, v. 4(1): p. 87-88 , 1992 (3 ref, Eng).

GC and GC/MS studies of essential oil of *L.zeylanica* revealed the presence of over 60 compounds, of which 44 were identified. The major constituents were linalool (54.91 percent) and beta-caryophyllene (17.42 percent).

9204-2550 Paliwal, M.K., Siddiqui, I.R. , Singh, S., Tiwari, H.P. (Department of Chemistry, University of Allahabad, Allahabad 211002, UP, India) **Phytochemical investigation of *Asterella angusta*.** *Journal of the Indian Chemical Society*, v. 68(9): p. 533-534, 1991 (7 ref, Eng).

Petroleum-ether extracts of *A.angusta* yielded hopan-22-ol, 3alpha, 21alpha, 22beta-trehydroxy 17-hydroxymethyl oleanane-12-ene-and isobicyclogermanen-14-al.

9204-2551 Pant, A.K., Singh, A.K., Mathela, C.S., Parihar, R., Vasu Dev, Nerop, A.T. , Bottini, A.T.(Department of Chemistry, G.B. Pant Agricultural University, Pantnagar 263145, UP, India) **Essential oil from *Hyptis suaveolens* Poit.** *Journal of Essential Oil Research*, v. 4(1): p. 9-13 , 1992 (18 ref, Eng).

The essential oil obtained from the aerial parts of *H.suaveolens* was found (by GC/MS) to differ chemically from that reported from chemotypes collected in South America and Malaysia. The main components of this Indian oil were sabinene (41.0 percent), beta-pinene (9.8 percent), beta-caryophyllene (7.9 percent), and limonene (6.8 percent), accompanied by more than 50 other compounds including (Z)-alpha-trans-bergamotol (2.0 percent),

caryophyllene oxide (5.8 percent), ar-abietatriene (4.4 percent), and ar-abietatrienol (0.4 percent).

9204-2552 Papanov, G., Bozov, P., Malakov, P. (Department of Organic Chemistry, University of Plovdiv, Tsar Assen 24 Street, 4000 Plovdiv, Bulgaria) **Triterpenoids from *Lavandula spica*.** *Phytochemistry*, v. 31(4): p. 1424-1426, 1992 (12 ref, Eng).

A new formyl ursolic acid (C₃₁H₄₈O₄) and five known triterpenoids were isolated from the aerial parts of *L.spica*. The structures of these compounds were established by spectral data and chemical reactions.

9204-2553 Pelletier, S.W. (Institute for Natural Products Research and School of Chemical Sciences, The University of Georgia, Athens, Georgia 30602) **Studies in the chemistry of natural products: Rearrangement reactions of diterpenoid and norditerpenoid alkaloids.** *Journal of Natural Products*, v. 55(1): p. 1-24, 1992 (30 ref, Eng).

The diterpenoid nitrogenous bases from the plant families Compositae, Escalloniaceae, Garryaceae, Ranunculaceae, and Rosaceae have long been of interest because of their pharmacological properties, complex molecular structures, and interesting chemistry. Most of these alkaloids have been isolated from species of *Aconitum* and *Delphinium* and *Garrya*. With respect to the chemistry, several unusual acid-catalyzed and base-catalyzed rearrangements of diterpenoid and norditerpenoid alkaloids are discussed. Certain rearrangement products under solvolytic conditions are considered.

9204-2554 Petri, G., Lemberkovics, E., Gundidza, M., Lelik, L., Biacsi, E. (Institute of Pharmacognosy, Semmelweis Medical University Ullo Street 26, H-1085 Budapest, Hungary) **Composition of essential oil from *Conyza pinnata*.** *Journal of Essential Oil Research*, v. 4(1): p. 77-78, 1992 (5 ref, Eng).

An essential oil of *C.pinnata* which was produced from finely powdered plant material, was examined by a combination of peak enrichment and GC/MS. Eleven components were fully characterized from which (E)-beta-ocimene (-40 percent) and cuminal alcohol (-25 percent) were the major components.

9204-2555 Phantong Son, Minh, N.T. (Laboratory of Chemistry of Natural Products, Faculty of Chemistry, University of Hanoi, Vietnam) **A new coumarine from *Artemisia carvifolia*.** *7th Asian Symposium on Med. Plants, Spices and Other Natural Prod. (ASOMPS VII)*. Manila, 2-7 February 1992 (2 ref, Eng).

From the aerial parts of the *A.carvifolia* a new coumarine has been isolated and identified as 5,8-dimethoxy-coumaurine on the basis of spectral data (MS, UV-, IR-, 1H-NMR- 13C-NMR and 13C-APT-spectrum) and through chemical transformation. (Abstr. No. MP-4).

9204-2556 Picheansoonthon, C., Doskotch, R.W. (Department of Pharmaceutical Botany and Pharmacognosy, Faculty of Pharmaceutical Sciences, Khon Kaen University, Khon Kaen 40002, Thailand) **Isolation and structure elucidation of three new sesquiterpene lactones from *Simsia foetida* var. *foetida*.** *7th Asian Symposium on Med. Plants, Spices, and Other Natural Prod. (ASOMPS VII)*. Manila, 2-7 February 1992 (1 ref, Eng).

Studies conducted on seven taxa of genus *Simsia* afforded thirty sesquiterpenes and two diterpenes, eighteen of which are new natural products. Three new sesquiterpene lactones, foctidolide ,B and C. were isolated from aerial parts of *S.foetida* var. *foetida*. Structures of these compounds were determined by spectroscopic methods. (Abstr. No. TP-4).

9204-2557 Pinho, P.M.M., Pinto, M.M.M., Kijjoa, A., Pharadai, K., Diaz, J.G., Herz, W. (Laboratorio de Quimica Organica, Faculdade de Farmacia, Universidade do Porto, 4000 Porto, Portugal) **Protoberberine alkaloids from *Coccinia fenestratum*.** *Phytochemistry*, v. 31(4): p. 1403-1407, 1992 (12 ref, Eng).

Stems of *C.fenestratum* from Thailand furnished the new protoberberine alkaloids oxypalmatine, (-)-8-oxotetrahydrothalifendine, (-)-8-oxoisocorypalmine and either (-)-8-oxothaicanine or (-)-8-oxo-3-hydroxy-2,4,9,10-tetramethoxyberbine in addition to berberine, the major alkaloid and (-)-8-oxocanadine.

9204-2558 Prakash, K., Deepak, D., Khare, A., Khare, M.P. (Department of Chemistry, University of Lucknow, Lucknow 226007, UP, India) **A pregnane glycoside from *Streblus asper*.** *Phytochemistry*, v. 31(3): p. 1056-1057, 1992 (9 ref, Eng).

A pregnane glycoside, named sioraside, has been isolated from *S.asper*. Its nchemical and spectroscopic data are consistent with the structure 3beta,14beta-dihydroxypregn-20-one-3-O-beta-D-(3-O-methyl)glucopyranoside.

9204-2559 Qian, T.X., Li, L.N. (Institute of Materia Medica, Chinese Academy Sciences, 1 Xian Nong Tan Street, Beijing 100050, China) **Isosalvianolic acid C, A depside possessing A dibenzoxepin skeleton.** *Phytochemistry*, v. 31(3): p. 1068-1070, 1992 (9 ref, Eng).

Isosalvianolic acid C, a new depside possessing a dibenzoxepin skeleton, was isolated from the aqueous extract of *Salvia chinensis* along with salvianolic acid B and D, lithospermic acid, rosmarinic acid, (R- $(+)$)-beta-(3,4-dihydroxyphenyl)lactic acid, caffeic acid and protocatechualdehyde.

9204-2560 Qiang, T.Y., Zhen, T., Xing, W.T. , Chen, Z.G.(Natural Laboratory of Applied Organic Chemistry, Department of Chemistry, Lanzhou University, Lanzhou; Gansu Province, People's Republic of China) **Two new sesquiterpenoids from *Celastrus rosthornianus*.** *Journal of Natural Products*, nv. 55(1): p. 126-128 , 1992 (8 ref, Eng).

Two new minor sesquiterpenoids have been isolated from the root bark of *Celastrus rosthornianus*. Their structures were elucidated, on the basis of spectral analysis including 2D NMR, as 1beta-acetoxy-8beta,9alpha-dibenzoyloxy-6alpha-hydroxy-2beta(alpha-methylbutanoyloxy)-beta-dihydroagarofuran and 1beta-acetoxy-9alpha-benzoyloxy-8beta(beta-furancarbonyloxy)-6alpha-hydroxy-2beta(alpha-methylbutanoyloxy)-beta-dihydroagarofuran.

9204-2561 Ragasa, C.Y., Padolina, W.G., Sato, T., Yamasaki, K., Yamauchi, T., Coll, J.C. , Bowden, B.F.(Department of Chemistry, De La Salle University, Manila, Philippines) **Sesquiterpene lactones from A Philippine medicinal plant, *Pseudoelephantopus spicatus* Rohr.** *7th Asian Symposium on Med. Plants, Spices and Other Natural Prod.(ASOMPS VII)*. Manila, 2-7 February 1992 (Eng).

A Philippine medicinal plant, *P.spicatus* (common name: dilang baka) was studied for its terpenoid chemistry. Four novel germacranolide sesquiterpene lactones were isolated from the leaves of the plant by vacuum liquid chromatography, gravity column chromatography and high pressure liquid chromatography and their structures were elucidated. Two of the compounds exhibited antimutagenic activity. (Abstr. No. TP-6).

9204-2562 Raina, M.L., Sarup, P.(Department of Chemistry, Delhi Institute of Technology, Delhi-110006) **Further chemical studies of *Polygonum amphibium* Linn.** *Journal of Indian Chemical Society*, v. 68(7): p. 425-426 , 1991 (2 ref, Eng).

Air dried leaves of *P.amphibium* yielded two glycosides viz., arabinose and xylose.

9204-2563 Ramanaiah, D., Sreeramulu, K. , Gunasekar, D.* (Department of Chemistry, Sri Venkateswara University, Tirupati 517 502, AP, India) **Phytochemical examination**

of the leaves of *Shuteria vestita*. *Journal of the Indian Chemical Society*, v. 68(7): p. 428 , 1991 (3 ref, Eng).

Air dried powdered leaves yielded dihydromyricetin, naringenin, naringin and myricetin. D-Glucose and L-rhamnose were the two sugar characterised.

9204-2564 Reina, M., Madinaveitia, A., De la Fuente, G., Rodriguez, M.L., Brito, I.(Centro de Productor Naturales Organicos "Antonion Gonzalez" CSIC, Universidad de La Laguna La Laguna, Tenerife, Spain) **Cardionidine, an unusual C-20 diterpenoid alkaloid from *Delphinium cardiotetalum* DC.** *Tetrahedron Letters*, v. 33(12): p: 1661-1662, 1992 (6 ref, Eng).

The structure of cardionidine (C₂₁H₂₅NOS; mp. 310-15 degree d), a new hetisine-type C₂₀ diterpenoid alkaloid bearing an anhydride function, inferred from spectroscopic and chemical data, and x-ray analysis has been reported. IARI, New Delhi.

9204-2565 Reznicek, G., Jurenitsch, J., Freiler, M. , Kornhammer, S.S., Haslinger, E., Hiller, K., Kubelka, W.(Institut fur Pharmakognoside der Universitat Wien Wahringer Strasse 25, A-1090 Wien, Austria) **Isolation and structure elucidation of further new saponins from *Solidago canadensis*.** *Planta Medica*, v. 58(1): p. 94-98, 1992 (17 ref, Eng).

Four new saponins (canadensis-saponins 5-8)(compounds 5-8) were isolated from *S.canadensis* using GC/MS, FAB-MS, and mainly 2D-NMR techniques their structures were elucidated.

9204-2566 Ruan, J.L., Wan, Y.W., Chen, G.X. , Ding, W.P.(Center of Reproductive Medicine, Tongji Medical University, Wuhan 430030) **Structure determination of marsdekoiside C.** *Acta Pharmaceutica Sinica*, v. 26(9): p. 667-671, 1991 (6 ref, Eng).

A pregnane glycoside ester was isolated from *Marsdenia koi* by column chromatography. The structure was identified on the basis of IR, 1H-NMR, 13C-NMR and FAB-MS. It is a new compound obtained from this plant for the first time and named as marsdekoiside C.

9204-2567 Ruangrungsi, N., Iinuma, M., Tanaka, T., Ohyama, M., Yokoyama, J., Mizuno, M.(Faculty of Pharmaceutical Sciences, Chulalongkorn University, Bangkok 10330, Thailand) **Three flavanones with a lavandulyl group in the roots of *Sophora exigua*.** *Phytochemistry*, v. 31(3): p. 999-1001, 1992 (14 ref, Eng).

Two novel flavanones with a lavandulyl residue, exiguaflavanones A and B, were isolated from the roots of *S.exigua* in addition to a known flavanone (sophoraflavanone G). The structure of the new flavanones

was determined to be 5,7,2',6'-tetrahydroxy-8-lavandulyl-(exiguaflavanone A) and 5,2',6'-trihydroxy-8-lavandulyl-methoxyflavanone (exiguaflavanone B) by means of 2D NMR spectral analysis.

9204-2568 Saden-Krehula, M.A., Kustrak, D.A.(Faculty of Pharmacy and Biochemistry, University of Zagreb, Zagreb, Yugoslavia) **delta4-3-Ketosteroids in flowers and leaves of Vitex agnus-castus.** *Acta Pharmaceutica Jugoslavica*, v. 41(3): p. 237-241, 1991 (14 ref, Eng).

Thin-layer chromatography of the extracts obtained from leaves and flowers of *V. agnus-castus* revealed the presence of progesterone and 17alpha-hydroxyprogesterone in the fractions of free and conjugated steroids. Testosterone and epitestosterone were detected only in free form in the flower extracts, and androstenedione was found in the extracts of the leaves of *V. agnus-castus*. Mass spectrometric investigations confirmed the presence of progesterone in flowers.

9204-2569 Sakamoto, S., Kuroyanagi, M., Ueno, A., Sekita, S. (School of Pharmaceutical Sciences, University of Shizuoka, 395 Yada, Shizuoka-shi 422 Japan) **Triterpenoid saponins from Sophora subprostrata.** *Phytochemistry*, v. 31(4): p. 1339-1342, 1992 (6 ref, Eng).

From *S. subprostrata* Radix, the roots of *S. subprostrata*, six triterpenoidal saponins having soyasapogenol A, B, sophoradiol and kuzusapogenol A as aglycones, were isolated as their methyl esters. The structures of a new saponin was established to be 3-O-{alpha-L-rhamnopyranosyl(1 to 2)-D-galactopyranosyl(1 to 2)-beta-D-glucuronopyranosyl} kuzusapogenol A methyl ester by means of 1H and 13C NMR spectroscopy and chemical evidence.

9204-2570 Salles, C., Jallageas, J.C., Fournier, F., Tabet, J.C., Crouzet, J.C.(Centre de Genie et Technologie Alimentaires, Institut des Sciences de l'Ingenieur, Universite de Montpellier II, 34095 Montpellier Cedex 5, France) **Apricot glycosidically bound volatile components.** *Journal of Agricultural and Food Chemistry*, v. 39(11): p. 1979-1983, 1991 (22 ref, Eng).

Apricot glycosidically bound components separated from chromatography were studied by negative ion chemical ionization (NICI) and negative ion desorption chemical ionization (NI-DCI) mass spectrometry (MS) and tandem mass spectrometry (MS/MS) and identified linalyl, alpha-terpinyl, neryl, geranyl, and benzyl glucosides. The presence of linalyl arabinoglucoside was established by identification of the glucoside derivative obtained by partial enzymatic hydrolysis. The MS and MS/MS spectra agree with the presence of hexyl glucoside and 2-phenylethyl

arabinoglucoside and presence of linalool oxide glucosides (four isomers detected). Shifts of 4 mass units were characteristic of the four dienediol glucosides isolated. One dienediol arabino-glucoside was also tentatively identified using the same method. These results show that glucosides are the major glycosidically bound volatile compounds present in apricot.

9204-2571 Santos, M.C., Mukherjee, R.(Laboratorio de Technologia Farmaceutica, Universidade Federal da Paraiba, 58059 Joao Pessoa, PB, Brazil) **Constituents of Jatropha mollissima roots.** *Fitoterapia*, v. 63(1): p. 88, 1992 (4 ref, Eng).

From 500g roots, triacontanol along with trace amounts of octacosanol and 1-dotriacontanol, betasitosterol, mixture of C18 to C28 saturated fatty acids and acetylaleuritolic acid were isolated and identified.

9204-2572 Saraswathy, A., Sasikala, E., Patra, A., Kundu, A.B.* (Department of Chemistry, University College of Science, 92 Acharya Profulla Chandra Road, Calcutta 700009, WB, India) **Betulin-2-acetate from Capparis sepiaria L..** *Journal of The Indian Chemical Society*, v. 68(11): p. 633-634, 1991 (3 ref, Eng).

Betulin-28-acetate (mp 204-06 degreeC) has been isolated from the whole plant of *C. sepiaria* and identified.

9204-2573 Satyanarayana, V., David Krupadanam, G.L., Srimannarayana, G.* (Department of Chemistry, Osmania University, Hyderabad 500007, AP, India) **Tetracyclic triterpenes from the latex of Euphorbia nivulia.** *Fitoterapia*, v. 63(1): p. 82-83, 1992 (9 ref, Eng).

From the latex of *Euphorbia nivulia*, cycloartenol, cycloeucalenol and cycloart-25-en-3beta, 24 (alpha or beta)-diol were isolated and identified.

9204-2574 Saxena, V.K.(Chemistry Department, University at Sagar, MP, India) **Potential antitumor Xanthanoloids from Xanthium plants.** *7th Asian Symposium on Med. Plants, Spices, and Other Natural Products (ASOMPS VII). Manila*, 2-7 February 1992 (Eng).

The alcoholic extracts of *X. strumarium* when worked up by C.C. yielded the following potential antitumor agents: Xanthinin (C17H22O5), Xanthumin (C17H22O5), 14-hydroxy xanthumin (C17H22O6), Xanthinosin (C14H22O3), and Xanthinin-6-beta-ol (C15H13O4). (Abstr.No. TP-24).

9204-2575 Saxena, V.K.*., Chaturvedi, P.K.(Natural Products Laboratory, Department of Chemistry, Dr. Harisingh Gour University, Sagar 470003, MP, India) **A novel cardenolide, canarigenin-3-O-alpha-L-rham-**

nopyranosyl-(1 to 5)-O-beta-D-xylofuranoside, from rhizomes of Convullaria majalis. *Journal of Natural Products*, v. 55(1): p. 39-42, 1992 (13 ref, Eng).

A novel cardenolide, canarigenin-3-O-alpha-L-rhamnopyranosyl-(1 to 5)-O-beta-D-xylofuranoside (C₃₄H₅₀O₁₂, mp 174 degree C, has been isolated from an EtOAc-soluble fraction of the rhizomes of *Convullaria majalis* and identified by chemical and spectral analysis.

9204-2576 Schenkel, E.P., Farias, M.R., Mayer, R., Breitmaier, E., Breitmaier, E., Rucker, G.(Faculdade de Farmacia, Universidade Federal do Rio Grande do Sul, Porto Alegre, Brazil) **Cucurbitacins from Wilbrandia ebracteata.** *Phytochemistry*, v. 31(4): p. 1329-1333, 1992 (12 ref, Eng).

Three new cucurbitacins were isolated from the roots of *W.ebracteata* and their structures established as 16alpha, 23alpha-epoxy-2beta,3beta,20beta-trihydroxy-10alpha,23beta-cucurbit-5,24-dien-11-one, 16alpha,23alpha-epoxy-2beta,3beta,20beta-trihydroxy-10alpha,23beta-cucurbit-5,24-dien-11-one and 2beta,3beta,16beta,20,25-pentahydroxy-10alpha-cucurbit-5,23-dien-11-one, mainly by spectroscopy.

9204-2577 Sener, B.(Gazi University, Faculty of Pharmacy, Department of Pharmacognosy, Ankara, Turkey) **Alkaloids and coumarins from some Rutaceae plants growing in Turkey.** *7th Asian Symposium on Med. Plants, Spices, and Other Natural Prod. (ASOMPS VII).* Manila, 2-7 February 1992 (Eng).

The Rutaceae family contain some 1600 spices and Turkey is reported to have genera with approximately 34 spices. Phytochemical studies of the Rutaceae of Turkey, have been done in detail. *Ruta* and *Halophyllum* spices show that apart from essential oils these species provide furocoumarins and furoquinoline alkaloids some of which are known to be biologically active. These medicinal plants particularly *Ruta montana* can be dangerous because of the possibility of causing photophytodermatitis during their collection. (Abstr.No. TP-9).

9204-2578 Shah, G.C., Bhandari, R., Mathela, C.S.(Chemistry Department, Kuman University, Nainital 263002, UP, India) **1,2-epoxy-p-menthane derivatives from some labiate species.** *Journal of Essential Oil Research*, v. 4(1): p. 57-59, 1992 (Eng).

The essential oils of *Plectranthus incanus* and *Clinopodium umbrosum* which were produced from plants were examined by GC/MS. Fourteen constituents were identified in *P.incanus* oil of which cis-piperitone oxide (35.70 percent) and piperitenone oxide (45.01 percent) were most predominant. Although only nine constituents were

identified in *C.umbrosum* oil, cis-piperitone oxide (63.05 percent) and piperitenone oxide (17.98 percent) were found as major constituents.

9204-2579 Shah, N., Thakur, R.S.(Central Institute of Medicinal and Aromatic Plants, Lucknow 226016, UP, India) **Chemical composition of the leaf/inflorescence oil of Seriphidium brevifolium (Wall.) Y.Ling et Y.R. Ling.** *Journal of Essential Oil Research*, v. 4(1): p. 25-28, 1992 (3 ref, Eng).

The chemical composition of the leaf/inflorescence oil of *S.brevifolium* which was obtained from mature and immature plants collected in an inner valley of Kumaon Himalaya, was examined by GC/MS. Forty six constituents were characterized in the "immature oil" and 63 constituents were identified in the "mature oil". The main components of "immature oil" were alpha-thujone(77.0 percent), beta-thujone (4.4 percent) and 1,8-cineole (3.3 percent), while the "mature oil" possessed alpha-thujone (60.2 percent), beta-thujone(5.5 percent) and 1,8-cineole (1.5 percent). The reason for a preference for the use of the immature leaves/inflorescence as an incense over the mature leaves/inflorescence is thought to be due to the higher total thujone and 1,8-cineole content of the oil.

9204-2580 Sharon, A., Ghirlando, R., Gressel, J.* (Department of Plant Genetics, The Weizmann Institute of Science, Rehovot 76100, Israel) **Isolation, purification and identification of 2-(p-hydroxyphenoxy)-5,7-dihydroxychromone: a fungal-induced phytoalexin from Cassia obtusifolia.** *Plant Physiology*, v. 98(1): p. 303-308, 1992 (20 ref, Eng).

A single phytoalexin was isolated and purified from 12- to 14-day-old leaves of *C.obtusifolia* inoculated with *Alternaria cassiae*. The structure was elucidated by 1H- and 13C-NMR and MS as 2-(p-hydroxyphenoxy)-5,7-dihydroxychromone. The compound was shown to be derived in part from phenylalanine. Radial growth of *A.cassiae* was inhibited 50 percent by the compound at 0.3 millimolar. IARI, New Delhi.

9204-2581 Shawl, A.S., Kumar, T.(Central Institute of Medicinal and Aromatic Plants, Regional Centre, Pulwama, Kashmir 192301, JK, India) **Isoflavonoids from Iris crocea.** *Phytochemistry*, v. 31(4): p. 1399-1401, 1992 (13 ref, Eng).

A new 12a-hydroxyrotenoid, 9-methoxyirispurinol, and a new isoflavone glucoside, tectorigenin 4'-glucoside, together with tectoridin, tectorigenin, 5,7-dihydroxy-6,2'-dimethoxyisoflavone and alipinone were isolated from the rhizomes of *I.crocea*. The structures of known and new

compounds were established by spectroscopic and chemical methods.

9204-2582 Shukla, Y.N., Thakur, R.S., Pachaly, P.(Central Institute of Medicinal and Aromatic Plants, Lucknow 226016, UP, India) **A bidesmosidic oleanolic acid saponin from Panax pseudo-ginseng.** *Phytochemistry*, v. 31(3): p. 1046-1048, 1992 (9 ref, Eng).

A novel triterpenoid saponin, pseudo-ginsenoside-RI3, isolated from the rhizomes of *P.pseudo-ginseng* subsp. *himalaicus* var. *angustifolius* has been characterized as 3-O-beta-D-glucopyranosyl(1 to 2)-beta-D-glucuronopyranosyl(1 to 6)-beta-D-glucopyranosyl 28-O-beta-D-xylopyranosyl-olean-12-en-28-oic acid ester by physicochemical methods.

9204-2583 Siddiqui, S., Faizi, S., Siddiqui, B.S.* , Ghiasuddin(HEJ Research Institute of Chemistry, University of Karachi, Karachi 75270, Pakistan) **Constituents of Azadirachta indica: Isolation and structure elucidation of a new antibacterial tetranortriterpenoid, mahmoodin, and a new protolimonoid, naheedin.** *Journal of Natural Products*, v. 55(3): p. 303-310, 1992 (29 ref, Eng).

Mahmoodin (C₃₀H₃₈O₈), a new limonoid, has been isolated from *A.indica* (neem) oil, along with seven known tetranortriterpenoids, azadirone, epoxyazadiradione, nimbin, gedunin, azadiradione, deacetyl nimbin, and 17-hydroxyazadiradione. A new protolimonoid, naheedin (C₃₂H₄₈O₆), has been obtained from the neem fruits along with azadirachtol. Their structures have been elucidated through chemical and spectral analyses including 2D NMR studies. The absolute configuration of mahmoodin was established by comparison of its cd spectrum with those of the known tetranortriterpenoids. Mahmoodin showed significant antibacterial activity against various Gram-positive and Gram-negative organisms. Four hydrocarbons, icosane, docosane, 2-methyltricosane, and docosene, have also been identified by GC-MS of the EtOH extract of the fruit coats. Only dicosane has earlier been reported from neem..

9204-2584 Singh, J., Tiwari, H.P.(Department of Chemistry, University of Allahabad, Allahabad-211002, UP, India) **Chemical examination of roots of Asparagus racemosus.** *Journal of The Indian Chemical Society*, v. 68(7): p. 427-428, 1991 (6 ref, Eng).

Ethanol extracts of roots yielded sitosterol, 4,6-dihydroxy-2-O-(-2'-hydroxy isobutyl) benzaldehyde and undecanyl cetanoate.

9204-2585 Sivakumar, R., Nair, A.G.(Department of Chemistry, Pondicherry University, Pondicherry 605014) **Polyphenolic constituents of the flowers of Berberis**

aristata. *Journal of The Indian Chemical Society*, v. 68(9): p. 531-532, 1991 (10 ref, Eng).

Alcoholic extracts of the flowers of *B.aristata* yielded caffeic acid, quercetin, chlorogenic acid (3-O-cafeoylquinic acid, meratin Quercetin 3-O-glucoside) and rutin.

9204-2586 Sotheeswaran, S., Pasupathy, V.(School of Pure and Applied Sciences University of the South Pacific SUVA, Fiji) **Distribution of resveratrol oligomers in plants.** *7th Asian Symposium on Med. Plants, Spices, and Other Natural Prod. (ASOMPS VII).* Manila, 2-7 February 1992 (Eng).

The isolations of several antifungal resveratrol oligomers, such as balanocarpol, copalligerols, stemonoporol, distichol, canaliculatol and vaticaffinol has been reported from plant sources, these antifungal phenols are not phytoalexins but are normal natural products, is presented. (Abstr. No. TO-7).

9204-2587 Souleles, C., Harvala, C., Chinou, J.(Laboratory of Pharmacognosy, Department of Pharmacy, University of Thessaloniki, 54006 Thessaloniki, Greece) **Flavonoids from Calamintha grandiflora.** *International Journal of Pharmacognosy*, v. 29(4): p. 317-319, 1991 (5 ref, Eng).

A new flavonoid, 3',4'-dimethoxyquercetin-3,7-di-O-glucoside (C₂₉H₃₄O₁₇) was isolated from the leaves and the flowers of *Calamintha grandiflora* and its structure elucidated by spectroscopic methods (UV, 1H-NMR, MS). Rutin and isorhamnetin-3-O-galactoside were also isolated.

9204-2588 Srivastava, S.K.(Central Institute of Medicinal and Aromatic Plants, Lucknow 226016, UP, India) **New triterpenic acid from Schefflera impressa.** *Journal of Natural Products*, v. 55(3): p. 298-302, 1992 (10 ref, Eng).

A new triterpene, 3alpha, 11alpha-dihydroxy lup-20(29)-en-28-oic acid, has (C₃₀H₄₈O₄), mp 234-36 degree C, has been isolated from the bark and stem of *S.impressa*. Its structure has been deduced from spectroscopic data and chemical investigations.

9204-2589 Sun, H., Zhou, Q., Fujita, T., Takeda, Y., Minami, Y., Maronaka, T., Lin, Z., Shen, X.(Laboratory of Phytochemistry, Kunming Institute of Botany, Academia Sinica, Kunming 650204, Yunnan, China) **Rubescensin D, A diterpenoid from Rabdosia rubescens.** *Phytochemistry*, v. 31(4): p. 1418-1419, 1992 (9 ref, Eng).

A new diterpenoid of novel structure, rubescensin D (C₂₀H₂₆O₆, mp 264-66 degree C) was isolated from the leaves of *R.rubescens* and the structure determined by detailed spectroscopic analysis with emphasis on 2D NMR data, as well as chemical evidence.

9204-2590 Sun, R.Q., Jia, Z.J., Cheng, D.L., Zhu, Z.Q.(Research Institute of Fine Chemicals, East China University of Chemical Technology, Shanghai 200237, People's Republic of China) **Four saponins from Oxytropis ochrocephala.** *Planta Medica*, v. 58(2): p., 1992 (1 ref, Eng).

From *O. ochrocephala* four saponins 1,2,3 and 4 were isolated. Saponins 1 and 2 are new compounds. The common genuine aglycone of the saponins is soyasapogenol B. The structures of those saponins were established by means of ¹³C-NMR, MS analyses, and chemical methods. In addition, a new interesting artifact aglycone was obtained from the hydrolysate of these saponins and its structure was elucidated by spectral analyses and chemical transformations.

9204-2591 Tanaka, T., Iinuma, M., Yuki, K., Fujii, Y., Mizuno, M. (Department of Pharmacognosy, Gifu Pharmaceutical University, 6-1 Mitahorahigashi 5 Chome, Gifu 502, Japan) **Flavonoids in root bark of Pongamia pinnata.** *Phytochemistry*, v. 31(3): p. 993-998, 1992 (19 ref, Eng).

Further investigation of the flavonoid constituents of *P. pinnata* resulted in the isolation of 18 flavonoid compounds including nine new ones, ponganones (from the root bark), and synthesis.

9204-2592 Taylor, W.C.(Department of Organic Chemistry, University of Sydney, NSW 2006, Australia) **The alkaloids of Eupomatia species.** *7th Asian Symposium on Med. Plants, Spices, and other Natural Prod. (ASOMPS VII). Manila*, 2-7 February 1992 (Eng).

Eupomatia laurina and *E. bennettii* are rich sources of novel lignans, neolignans and alkaloids. Isolation of the constituents and the alkaloids, which have structures based on naphthonaphthyridine and azafluoranthene ring systems, have been described (Abstr.No. MO-1).

9204-2593 Thoison, O., Hnawia, E., Gueritte-Voegelein, F., Sevenet, T.(Institut de Chimie des Substances Naturelles, CNRS, 91198 Gif-sur-Yvette Cedex, France) **Vedelianin, A hexahydroxanthene derivative isolated from Macaranga vedeliana.** *Phytochemistry*, v. 31(4): p. 1439-1442, 1992 (7 re, Eng).

Methanolic extract of the leaves of *M. vedeliana* yielded vedelianin (yield 1.33 percent) which can be considered as a substituted cyclized geranylstilbene.

9204-2594 Tih, A., Tih, R.G., Sondengam, B.L., Marin, M.T., Bodo, B.(Department of Organic Chemistry, Faculty of Science, University of Yaounde, BP812, Yaounde,

Cameroon) **Tetraflavonoids of Lophira alata.** *Phytochemistry*, v. 31(3): p. 981-984, 1992 (11 ref, Eng).

A new tetraflavonoid, lophiroflavan A, was isolated from the stem bark of *L. alata* along with lophirochalcone. Both compounds were obtained as their permethyl ether derivatives and their structures determined from spectroscopic and chemical evidence.

9204-2595 Tinto, W.F., Blair, L.C., Allil, A., Reynolds, W.F., Mclean, S.* (Department of Chemistry, University of Toronto, Toronto MSS 1A1, Canada) **Lupane triterpenoids of Salacia cordata.** *Journal of Natural Products*, v. 55(3): p. 395-398, 1992 (7 ref, Eng).

The stem bark of *S. cordata* has afforded 28-hydroxylup-2-(29)-en-3-one, 30-hydroxylup-20(29)-en-3-one, betulin, pyracrenic acid, and a new compound, 15, 28-dihydroxylup-20(29)-en-3-one. Two-dimensional nmr methods have been used to assign structures and nmr spectra.

9204-2596 Tits, M., Angenot, L., Poukens, P., Warin, R., Dierckxsens, Y. (Institut de Pharmacie, Universite de Liege, rue Fusch, 5, B-4000 Liege, Belgium) **Prodelphinidins from Ribes nigrum.** *Phytochemistry*, v. 31(3): p. 971-973, 1992 (18 ref, Eng).

R. nigrum leaves yielded three anti-inflammatory (Black currant) prodelphinidins. These compounds were identified and characterized; two known prodelphinidin dimers gallicatechin-(4alpha-8)-epigallicatechin and gallicatechin-(4alpha-8)-gallicatechin found together for the first time and a new prodelphinidin trimer gallicatechin-(4alpha-8)-gallicatechin-(4alpha-8)-gallicatechin.

9204-2597 Tommasi, N.D., Aquino, R., Simone, D., Piacente, S., Pizza, C.(Dipartimento di Chimica delle Sostanze Naturali, Universita degli Studi di Napoli, "Federico II", via D.Montesano 49, 80131, Napoli, Italy) **Diterpenes from Werneria dactylophylla.** *Phytochemistry*, v. 31(3): p. 1042-1043, 1992 (10 ref, Eng).

The aerial parts of *W. dactylophylla* afforded the new diterpene, ent-16-hydroxy-14xi, 15xi-epoxy-13-epi-manoyl oxide, and the known ones, ent-13-epi-manoyl oxide, ent-16-hydroxy-13-epi-manoyl oxide and ent-14xi,15xi-epoxy-13-epi manoyl oxide. Structures were elucidated by spectral data.

9204-2598 Torres, R.C., Ragadio, A.G.(Industrial Technology Development Institute Gen.Santos Ave., Bicutan, Taguig Metro Manila, Philippines) **Chemical Composition of the essential oil of Philippine Cymbopogon citratus (DC) Stapf.** *7th Asian Symposium of Med.*

Plants, Spices, and Other Natural Prod. (ASOMPS VII).
Manila, 2-7 February 1992 (Eng).

Essential oil was obtained from air-dried leaves by hydro-distillation and purified with anhydrous sodium sulfate and purified. Components were identified by a peak enrichment method using standards. Citral was identified as the main component (69.39 percent), Geraniol, myrcene, alpha and beta-pinene, camphene, 1,8-cineole, limonene, phellandrene, menthol, heptenone, citronellal, linalool, caryophyllene, menthol, terpineol and citronellol were the other constituents detected. (Abstr. No. WP-3).

9204-2599 Tripathi, A.K., Khan, S.A., Vaishnav, M.M., Gupta, K.R., Singh, J. (Chemistry Department, Govt. Model Science College, Bilaspur, 495001, MP, India) **Compounds of taxonomic significance in Tagetes.** *Fitoterapia*, v. 63(1): p. 85, 1992 (Eng).

5-(But-1-ol-3-ynyl)-2,2'-bithienyl (20 mg), ethyl gallate (30mg),, flavonoids phenols and thienyl derivatives were isolated from the whole dried plants of *T. erecta*.

9204-2600 Tripathi, A.K., Tripathi, A.K., Paliwal, M.K., Singh, J. (Chemistry Department, Government Science PG College, Bilaspur 495001, MP, India) **Isorhamnetin-7-O-beta-D-galactoside from Tagetes patula.** *Journal of the Indian Chemical Society*, v. 68(2): p. 674, 1991 (4 ref, Eng).

Isorhamnetin-7-O-beta-D-galactoside has been isolated from the 90 percent ethanol extract of shade-dried flowers and characterized.

9204-2601 Tu, Y.Q., Li, Z.Z., Chem, Y.Z. (National Laboratory of Application Organic Chemistry, Department of Chemistry, Lanzhou University, Lanzhou, People's Republic of China) **Sesquiterpene from Celastrus rosthornianus.** *Phytochemistry*, v. 31(4): p. 1415-1417, 1992 (12 ref, Eng).

A new sesquiterpene polyol ester, 1beta-acetoxy-2beta,8beta,9alpha-tribenzoyloxy-6alpha-hydroxy-beta-dihydroagarofuran, was isolated from the root bark of *C. rosthornianus*. Its structure was elucidated mainly on the basis of 1D and 2D NMR spectrometry. The complete assignment of the ¹³C NMR chemical shifts, and the determination of 1H-1H weak coupling observed in the 1H NMR spectrum were also carried out on the basis of the 2D NMR spectra.

9204-2602 Tuchinda, P., Udhachon, J., Reutrakul, V., Santisuk, T., Taylor, W.C., Farnsworth, N.R., Pezzuto, J.M., Kinghorn, A.D. (Department of Chemistry, Faculty of Science, Mahidol University, Rama VI Rd., Bangkok 10400, Thailand) **Bioactive butenolides from Melodorum fruticosum.** *7th Asian Symposium on*

Med. Plants, Spices and Other Natural Prod. (ASOMPS VII).
Manila, 2-7 February 1992 (Eng).

From leaves and branches of *M. fruticosum*, five butenolides have been isolated. In addition, two known flavonoids (chrysin, pinocembrin) and benzoic acid were isolated. All butenolides showed cytotoxicity in several tumor cell lines. The structures of the isolated compounds were elucidated by spectroscopic methods. (Abstr. No. WP-20A).

9204-2603 Tucker, A.O., Maciarello, M.J. (Department of Agriculture and Natural Resources Delaware State College, Dover, DE 19901-2275, USA) **Volatile leaf oils of caribbean Myrtaceae. IV. Pimenta jamaicensis (Britton & Harris) proctor of Jamaica.** *Journal of Essential Oil Research*, v. 4(1): p. 93-94, 1992 (3 ref, Eng).

The foliar oils of *P. jamaicensis* which were analyzed by GC/MS, were found to possess oils which were dominated by either eugenol (61.79 percent) and limonene (10.33 percent) with a lesser amount of beta-caryophyllene (5.77 percent), or 1,8-cineole (43.94-49.43 percent), alpha-terpineol (0.34-18.02 percent) and p-cymene (2.25-10.25 percent) with a lesser amount of 4-terpineol (6.37-7.17 percent).

9204-2604 Tuntiwachwutikul, P. (Silpakorn University, Thailand) **The chemistry of Kaempferia.** *Zingiberaceae Workshop, Prince of Songkla University, Hat Yai, Thailand*, p. 10, 15-18 Oct. 1991 (Eng).

Seven species of *Kaempferia*, *K. galanga*, *K. parviflora*, *K. angustifolia*, *K. rotunda* and three unnamed *Kaempferia* species have been investigated. Four major classes of structures, cinnamate esters, flavonoids, diterpenoids and cyclohexane oxide derivatives have been found. The chemistry of these classes have been reviewed with particular emphasis on the diterpenoid and cyclohexane oxide derivatives. (Abstr. No. 0920-0940).

9204-2605 Tuntiwachwutikul, P., Pancharoen, O., Prawat, U., Taylor, W.N.C., Taylor, W.C. (Faculty of Science, Silpakorn University, Nakorn Pathom 7300, Thailand) **Terrestrial natural products.** *7th Asian Symposium on Med. Plants, Spices and Other Natural Prod. (ASOMPS VII).* Manila, 2-7 February 1992 (Eng).

Four species of genus *Kaempferia* have been investigated, namely *K. parviflora*, *K. angustifolia* and two unnamed *Kaempferia* species (local name: krachai-kao and chang-ngung). The rhizomes of *K. parviflora* yielded sixteen flavonoids. The major constituent, 5,7-dimethoxyflavone was found to be anti-inflammatory and the activity was comparable to aspirin. Work on *K. angustifolia* and *Kaempferia* sp. (local name: krachai-kao) led to the isolation

tion of two cyclohexane diepoxide analogs, (-)-pipoxide 3(+)-zeylenol and two (+)-zeylenol related substances. (Abstr. No. WO-1).

9204-2606 Uden, W.V., Homan, B., Woerdenbag, H.J. , Pras, N., Malingre, T.M., Wicher, H.J. , Harkes, M.(Laboratory for Pharmacognosy, University of Groningen, A. Deusinglaan 2, NL-9713 AW Groningen, The Netherlands) **Isolation, purification, and cytotoxicity of 5-methoxypodophyllotoxin, a lignan from a root culture of *Linum flavum*.** *Journal of Natural Products*, v.55(1): p.102-110, 1992 (33 ref, Eng).

A method developed for the large scale isolation of 5-methoxypodophyllotoxin from a high-producing root culture derived from *Linum flavum*. A closely related lignan, 5'-demethoxy-5-methoxypodophyllotoxin, was also present in the root culture and was the cause of the main isolation difficulties. Essential steps in the isolation procedure are CH₂Cl₂ and XAD-4 extraction and XAD-8 cc followed by Si gel chromatography, using two different mobile phases. The isolated 5-methoxypodophyllotoxin was very pure (greater than 99 percent) and possessed the desired stereochemical configuration, namely (-)-5-methoxypodophyllotoxin. The *in vitro* cytotoxicity of 5-methoxypodophyllotoxin against EAT and HeLa cells was determined and compared with those of podophyllotoxin, etoposide (VP-16-213), teniposide (VM-26), and 5-methoxypodophyllotoxin-4beta-D-glucoside. 5-Methoxypodophyllotoxin exhibited almost the same cytotoxic potency as podophyllotoxin.

9204-2607 Ueyama, Y., Hashimoto, S., Nii, H. , Furukawa, K.(Tokyo Research Laboratory of Nagaoka Perfumery Company, 3-9,2-chome, Nishishinbashi, Minato-ku, Tokyo 105, Japan) **The chemical composition of the flower oil and the leaf oil of *Michelia alba* D.C..** *Journal of Essential Oil Research*, v. 4(1): p. 15-23 , 1992 (21 ref, Eng).

Approximately 100 compounds were characterized in both oils, with linalool being the major component of the flower oil (72.8 percent) and the leaf oil (80.1 percent), respectively. The most abundant minor components of the flower oil were alpha-terpineol (6.04 percent), beta-phenylethyl alcohol (2.58 percent), beta-pinene (2.39 percent), methyl 2-methylbutyrate (1.46 percent), geraniol (1.23 percent), and 1,8-cineole (1.03 percent). The most abundant minor components of the leaf oil were betacaryophyllene (3.0 percent), beta-elemene(1.7 percent), caryophyllene oxide (1.68 percent), and nerolidol (1.19 percent). Over 70 percent of the components characterized in the oils were found as trace constituents (percent). Enantiomeric separation using chiral GC revealed that the absolute configuration of linalool was (R)-75 percent: (S)-

25 percent and (R)-95.3 percent: (S)-4.7 percent for flower oil and leaf oil, respectively.

9204-2608 Ulubelen, A., Mericli, A.H. , Mericli, F., Ilarslan, R. (Faculty of Pharmacy, University of Istanbul, Istanbul, Turkey) **Diterpene alkaloids from *Delphinium peregrinum*.** *Phytochemistry*, v. 31(3): p. 1019-1022, 1992 (19 ref, Eng).

Three new lycocotonine-type diterpene alkaloids peregrine alcohol, pergiline and delphiperegrine were isolated from the aerial parts of *D.peregrinum*. The structures were established by spectral and chemical data.

9204-2609 Ulubelen, A., Tan, N., Uceur, M.(Faculty of Pharmacy, University of Istanbul, Istanbul, Turkey) **Flavonoids from *Polygonum cognatum*.** *Fitoterapia*, v. 63(1): p. 87, 1992 (15 ref, Eng).

Quercetin-3-methyl ether, quercetin-3-glucoside, quercetin-3-rutinoside, kaempferol-3-methyl ether, kaempferol-3-glucoside, chrysine, beta-sitosterol, p-hydroxybenzoic acid, vanillic acid, gallic acid and protocatechuic acid were isolated from *P.cognatum*.

9204-2610 Urushibara, S., Kitayama, Y. , Watanabe, T., Okuno, T.* , Watarai, A. , Matsumoto, T.(Faculty of Agriculture, Hirosaki University, Hirosaki 036, Japan) **New flavonol glycosides, major determinants inducing the green fluorescence in the guard cells of *Allium cepa*.** *Tetrahedron Letters*, v. 33(9): p. 1213-1216, 1992 (15 ref, Eng).

Two new flavonol glycosides were isolated from epidermis of *A.cepa*. Their structures were determined to be kaempferol 3-O-sophoroside-7-O-glucuronide and quercetin 3-O-sophoroside-7-O-glucuronide by NMR spectral data and hydrolysis. From their fluorescence properties, the latter seemed to be mainly responsible for fluorescence in guard cells of *A.cepa*. IARI, New Delhi.

9204-2611 Valsakumari, M.K., Sulochana, N.* (Department of Chemistry, Regional Engineering College, Trichy 620015, TN, India) **Chemical examination of *Acacia leucophloea* Willd..** *Journal of the Indian Chemical Society*, v. 68(12): p. 673-674, 1991 (2 ref, Eng).

Myricetin, quercetin, 3'-hydroxy-3-methoxyisoflavone and apigenin-8-C-glucoside have been isolated from the flowers of *A.leucophloea* and identified.

9204-2612 Van Sung, T.(Institute of Natural Products Chemistry, Nghia-Do, Tu Liem, HANOI, Vietnam) **Phytochemical investigations on *Homalomena aromatica* Schott (Araceae).** *7th Asian symposium on*

Med. Plants, Spices, and Other Natural Prod. (ASOMPS VII). Manila, 2-7 February 1992 (Eng).

From the chloroform extract of the rhizones of *H.aromatica* 5 new sesquiterpene alcohol together with 5 known ones, were isolated. The structures of the compounds were determined by spectroscopic methods, especially the 2D NMR spectroscopy and the X-ray analysis, as well as by chemical transformations. (Abstr. No. MO-8).

9204-2613 Velcheva, M., Dutschewska, H.* , Samuelsson, G. (Institute of Organic Chemistry with Centre of Phytochemistry, Bulgarian Academy of Sciences, BG-1113 Sofia, Bulgaria) **Alkaloids of the roots of *Thalictrum flavum* L..** *Acta Pharmaceutica Nordica*, v. 4(1): p. 57-58, 1992 (7 ref, Eng).

The main alkaloid in the roots of *T.flavum* is berberine. The alkaloids glaucine, thalicsimidine, thaliglucine, thalidazine, hernandezine and thalfoetidine were also isolated.

9204-2614 Venkata Rao, E., Rajendra Prasad, Y. , Ganapaty, S. (Department of Pharmaceutical Sciences, Andhra University, Waltair 530003, AP, India) **Three prenylated isoflavones from *Milletia auriculata*.** *Phytochemistry*, v. 31(3): p. 1015-1017, 1992 (15 ref, Eng).

Chemical examination of the chloroform extract of the roots of *M.auriculata* has yielded three new prenylated isoflavones in addition to the previously reported isoflavones isoauriculatin, auriculin, millettin, auriculatin, scandenone and the rotenoid sumatrol.

9204-2615 Venkatanarasimhan, M., Kundu, A.B. , Banerjee, S., Patra, A.(Captain Srinivasa Murti Drug Research Institute for Ayurveda, Arumbakkam, Madras 600106, TN, India) **Occurrence of two new esters of 6beta-hydroxy loganin in *Nyctanthes arbor-tristis*.** *Journal of the Indian Chemical Society*, v. 68(10): p. 581-584, 1991 (12 ref, Eng).

Isolation and characterisation of mixture of two new esters of 6beta-hydroxy loganin from the leaves has been reported. The iridoids are the aryl esters of 6beta-hydroxyloganin.

9204-2616 Verdoorn, G.H., Van Wyk, B.E.(Department of Chemistry and Biochemistry, Rand Afrikaans University, Johannesburg 2000, South Africa) **Oxypterine, a chlorinated alkaloid from *Lotononis subsection rostrata*.** *Phytochemistry*, v. 31(3): p. 1029-1032, 1992 (21 ref, Eng).

A new alkaloid, oxypterine, was isolated from *L.oxyptera*. It was also detected in related species of the subsection *rostrata*. The structure consists of an azacyclooctane ring with methylene, chloro and chloromethylene substituents.

Mass spectrometry and 1D and 2D NMR experiments were used in the structural analysis of the new product.

9204-2617 Vilegas, J.H.Y., Gottlieb, O.R.(Instituto de Quimica, Universidade de Sao Paulo, 05508, Sao Paulo, Brazil) **Benzylisoquinoline alkaloids from *Ocotea teleiandra*.** *Revista Latinoamericana de Quimica*, v. 22(4)+23(1): p. 18-19, 1992 (8 ref, Eng).

The aporphine alkaloids hernovine, nandigerine, lactine, lactanine, ovigerine and a novel 2-methyl-1(p-methoxybenzyl)-7-methoxy-isoquinolinium salt have been isolated from the trunk wood of *O.teleiandra* and identified.

9204-2618 Villasenor, I.M., Edu, D.A. , Bremner, J.B.(Institute of Chemistry, University of the Philippines, Quezon City, Philippines) **Antimutagen from leaves of *Carmona retusa*.** *7th Asian Symposium on Med. Plants, Spices, and Other Natural Prod. (ASOMPS VII). Manila, 2-7 February 1992 (Eng).*

An antimutagen has been isolated from the leaves of *C.retusa*. The extracts of the leaves were purified by solvent partition and liquid chromatography. The micronucleus test, an in vivo method using albino mice as the test system, was used for monitoring the antimutagenicity of the various fractions against tetracycline, a known mutagen. The structure of the isolated mutagen has been characterized to be a phytoene derivatives. (Abstr. No. TP-14).

9204-2619 Vollanueva, M.A.(Industrial Technology Development, Institute, Bicutan, Metro Manila, Philippines) **A phytochemical investigation of *Entada phaseoloides* Linn..** *7th Asian Symposium on Med. Plants, Spices and Other Natural Products (ASOMPS VII). Manila, 2-7 February 1992 (Eng).*

From the ether fraction of the crude methanol extract of *E.phaseoloides* bark, a pentacyclic triterpenoid (lupeol) and a phytosterol (alpha-spinasterol) were isolated. Acid hydrolysis of the butanol fraction yielded three pentacyclic sapogenins, namely: oleanolic acid (C₃₀H₄₈O₇), echinocystic acid (C₃₀H₄₈O₄) and entagenic acid (C₃₀H₄₈O₅). (Abstr. No. TP-5).

9204-2620 Waksman de Torres, N., Ramirez Duron, R.(Department of Pharmacology and Toxicology, School of Medicine, UANL Monterrey, NL Mexico) **Isolation of a new dimeric anthrancenone from *Karwinskia parvifolia*.** *Revista Latinoamericana de Quimica*, v. 22(4)+23(1): p. 25-27, 1992 (8 ref, Eng).

Three compounds responsible for the toxicity of fruits of *K.parvifolia* have been isolated and identified as 3,4-dihydro-3,3'-dimethyl-1',3,8,8'-9-pentahydroxy-(7,10')-b

ianthracene -1,9'(2H,10'H)dione, 3,3'-dimethyl-3,3',8,8',9,9'-hexahydroxy-3,3'-4,4'-tetrahydroxy-(7,10')-bianthracene-1,1'-(2H,2'H')dione, and 3,3'-dimethyl-3,3',8,8',9,9'-hexahydroxy-3,3',4,4'-tetrahydro-(7,10')-bianthracene-1,1'-(2H,2'H)-dione.

9204-2621 Wang, H.B., Yu, D.Q., Liang, X.T.* (Institute of Material Medica, Chinese Academy of Medical Sciences, 1 Xian Nong Tan Street, Beijing 100050, China) **Structure of a new neolignan glycoside from Stauntonia chinensis.** *Journal of Natural Products*, v. 55(2): p. 214-216, 1992 (8 ref, Eng).

A neolignan glycoside, named yemuoside YM1, was obtained from 70 percent alcoholic extracts of whole plants of *S.chinensis*. The structure of yemuoside was elucidated on the basis of chemical evidence and spectroscopic studies.

9204-2622 Wang, M., Guan, X., Han, X., Hong, S. (Henan Institute of Chemistry, Zhengzhou, 450003, People's Republic of China) **New triterpenoid saponin from Ardisia crenata.** *Planta Medica*, v. 58(2): p. 205-207, 1992 (3 ref, Eng).

A new triterpenoid saponin, ardicrenin, isolated from the roots of *A.crenata* was established as cyclamiretin A-3-O-(alpha-L-rhamnopyranosyl-(1-4)-beta-D-glucopyranosyl-(1-4)-beta-D-glucopyranosyl-(1-2))-alpha-L-arabinopyranoside. A partially hydrolyzed saponin was characterized as cyclamiretin A-3-O-beta-D-glucopyranosyl-(1-2)-alpha-L-arabinopyranoside.

9204-2623 Warashina, T., Miyase, T., Ueno, A. (School of Pharmaceutical Sciences, University of Shizuoka, Yada, 395, Shizuoka 422, Japan) **Phenylethanoid and lignan glycosides from Verbascum thapsus.** *Phytochemistry*, v. 31(3): p. 961-965, 1992 (5 ref, Eng).

V.thapsus afforded, in addition to three known phenylethanoid glycosides and four lignan ones, five new phenylethanoid glycosides and one lignan glycoside. Structures of the compounds were elucidated by spectroscopic methods and chemical evidence.

9204-2624 Warashina, T., Miyase, T.*., Ueno, A. (School of Pharmaceutical Sciences, University of Shizuoka, 395 Yada, Shizuoka 422, Japan) **Iridoid glycosides from Verbascum thapsus L.** *Chemical & Pharmaceutical Bulletin*, v. 39(12): p. 3261-3264, 1991 (13 ref, Eng).

Five novel iridoid glycosides were isolated from the fresh whole plants of *V.thapsis*. The structures of these iridoid glycosides were determined on the basis of spectral and chemical evidence. These compounds were classified into two types: one iridoid glycoside contains ajugol, and

the others contain 6-O-(alpha-L-rhamnopyranosyl)-catalpol in the structures.

9204-2625 Weyerstahl, P., Marschall-Weyerstahl, H., Kaul, V.K. (Institut fur Organische Chemie, Technische Universitat Berlin Strasse des 17. Juni 135, D-1000 Berlin 12, Germany) **Constituents of the essential oil of Artemisia persica.** *Journal of Essential Oil Research*, v. 4(1): p. 1-7, 1992 (11 ref, Eng).

The essential oil from *A.persica* was found to contain mainly functionalized monoterpenes with artemisyl (artemisia ketone, yomogi alcohol) and thujyl skeleton (sabinene, trans-sabinol, cis- and trans- sabinene hydrate, alpha- and beta-thujone, thujenol, trans-sabinyll acetate).

9204-2626 Witte, L., Ernst, L., Wray, V., Hartmann, T. (Institut fur Pharmazeutische Biologie, Technische Universitaet, W-3300 Braunschweig, Germany) **Revised structure of the main alkaloid of Senecio adonisifolius.** *Phytochemistry*, v. 31(3): p. 1027-1028, 1992 (8 ref, Eng).

Structure of the main pyrrolizidine alkaloid, adonisoline, from *S.adonisifolius* is determined by GC-MS and ¹H and ¹³C-NMR. ¹H-detected 2D long-range ¹H/¹³C-shift correlation proves a pentacyclic structure with a 1,5-dioxa-spiro 2,5 octane subunit. Previous structures claimed for adonisoline has been revised.

9204-2627 Wollenweber, E., Graven, E.H. (Institut fur Botanik der Technischen Hochschule, Schnittspahnstrasse 3, D-61100 Darmstadt, Germany) **Flavonoid aglycones of oval leaf buchu, Barosma crenulata.** *Fitoterapia*, v. 63(1): p. 86, 1992 (2 ref, Eng).

Air-dried leafy twigs (93 g) rinsed with acetone yielded some 54 mg of resinous material. TLC of the acetone leaf wash revealed the presence of four flavonol aglycones unambiguously identified to be the 3-methyl and the 3,4'-dimethyl ethers of kaempferol and the 3-methyl and the 3,3'-methyl ethers of quercetin.

9204-2628 Wu, J.Z., Tang, M., Wang, R. (Department of Pharmacy, Tongji Medical University, Wuhan 430030, China) **Studies on chemical constituents of Fritillaria in Hubei. XIII. Isolation and structure elucidation of hupehemonoside.** *Acta Pharmaceutica Sinica*, v. 26(11): p. 829-835, 1991 (14 ref, Jap, Eng).

A new D/E cis-5-cevanine alkaloidal glucoside, C₃₃H₅₃NO₈, mp 206 to 208 degree C, named hupehemonoside, was isolated together with three known alkaloids, peimine, peiminine and ebeiensine from the fresh bulb of *F.hupehensis*. On the basis of the IR, ¹H-NMR, ¹³C-NMR, FAB-MS and EI-MS of hupehemonoside, it has

been established as 5alpha, 14alpha, 17beta, 22beta-cevanine-20beta-hydroxyl-3beta-O-beta-D-glucoside.

9204-2629 Xu, J.P., Xu, R.S., Li, X.Y. (Shanghai Institute of Materia Medica, Academia Sinica, Shanghai 200031, People's Republic of China) **Four new cycloartane saponins from Curculigo orchoides.** *Planta Medica*, v. 58(2): p. 208-210, 1992 (9 ref, Eng).

Four new cycloartane-type triterpene glycosides named curculigosaponins G, H, I and J have been isolated from rhizomes of *C.orchoides* (Chinese name: Xiao Mao). Their structure were elucidated by FAB-MS, 1H- 13C-NMR, and 2D-NMR analysis and chemical evidence. A pharmacological study showed that curculigosaponin G increased the weight of the thymus *in vivo* in mice.

9204-2630 Xue, S.R., Liu, J.Q., Wang, G. (Department of Pharmacy, Anhui College of Traditional Chinese Medicine, Hefei, Anhui 230038, China) **Triterpenoid saponins from Clinopodium polycephalum.** *Phytochemistry*, v. 31(3): p. 1049-1050, 1992 (2 ref, Eng).

A new triterpenoid saponin, clinopodiside A, has been isolated from *C.polycephalum* (Duanxueliu) Chinese. Its structure was established by spectroscopic methods and X-ray diffraction analysis as 3-O-beta-D-glucopyranosyl (1-6)-(beta-D-glucopyranosyl (1-4)-beta-D-glucopyranosyl-olean-11,13(18)-diene-3beta, 16beta,23,28-tetrol.

9204-2631 Yadava, R.N., Singh, A. (Department of Chemistry, Dr HS Gour University, Sagar 470003, MP, India) **Novel flavanol glycoside from Crotalaria prostrata Rottl.** *Journal of the Indian Chemical Society*, v. 68(11): p. 632-633, 1991 (8 ref, Eng).

Taxifolin 3-O-beta-D-galactopyranosyl (1 to 6)-O-beta-D-glucopyranoside has been isolated from the seeds of *C.prostrata* and characterized.

9204-2632 Yahara, S., Kobayashi, N., Izumitani, Y., Nohara, T.* (Faculty of Pharmaceutical Sciences, Kumamoto University, Oe-honmachi 5-1, Kumamoto 862, Japan) **New acyclic diterpene glycosides, capsianosides VI, G and H from the leaves and stems of Capsicum annuum L.** *Chemical & Pharmaceutical Bulletin*, v. 39(12): p. 3258-3260, 1991 (2 ref, Eng).

Three new acyclic diterpene glycosides, named capsianosides VI(1), G(2) and H (3), along with capsianosides II, A,B,C and D were isolated from the leaves and stems of the *C.annuum* species, and their structures were elucidated by spectroscopic and chemical means.

9204-2633 Yamamoto, A., Miyase, T.* Ueno, A., Maeda, T. (School of Pharmaceutical Sciences, University of Shizuoka, 395, Yada, Shizuoka 422, Japan) **Buddlejasaponins I-IV, four new oleanane-triterpene saponins from the aerial parts of Buddleja Japonica Hemsl.** *Chemical & Pharmaceutical Bulletin*, v. 39(10): p. 2764-2766, 1991 (12 ref, Eng).

Four new oleanane-type triterpene saponins, named buddejasaponins I,II,III and IV were isolated from the aerial parts of *B.japonica*, together with a known saponin saikosaponin a. Their structures were elucidated on the basis of the chemical and spectroscopic studies.

9204-2634 Yang, C.R. (Kunming Institute of Botany, Academia Sinica, Kunming, 650204, China) **New glycosides from the medicinal plants in the west of China.** *7th Asian Symposium on Med. Plants, Spices and Other Natural Prod.(ASOMPS VII).* Manila, 2-7 February 1992 (Eng).

The following plant resources used as traditional or folk medicine in China, has been investigated for glycosides: *Gentiana urnula*, *Scrophularia spicata*, *Sipholostegia chinensis*, *Ligustrum purpurascens*, *Decaisnea fargesii*, *Madhuca butyracea*, *Pulsatilla campanella*, *Polygonatum kingianum*, *P.pratii*, *Peliosanthes delavayi*. The results are significant for chemotaxonomy and utilization of the medicinal plants. (Abstr.No. WO-6).

9204-2635 Yang, L., Ye, Y., Yuan, H., Xing, Q (Department of Chemistry, Peking University, Beijing 100871, 9RC) **Isolation and identification of gamma-aminobutyric acid and quantitative analysis of its amino acid contents from Panax ginseng.** *Chinese Science Bulletin*, v. 36(20): p. 1706-1710, 1991 (6 ref, Eng).

Quantitative determination of both free and combined amino acids has been reported. Among the free amino acids the first four were found to be in the order of Arg, Pro, Glu and GABA while total amino acids of powdered ginseng were in the order of Arg, Glu, Asp and Pro.

9204-2636 Yang, M.H., Blunden, G., O'Neill, M.J., Lewis, J.A. (School of Pharmacy and Biomedical Sciences, Portsmouth Polytechnic, Portsmouth, PO1 2DZ, UK) **Tormentic acid and 2alpha-hydroxyursolic acid from Arnebia euchroma.** *Planta Medica*, v. 58(2): p. 227, 1992 (2 ref, Eng).

Two triterpenoid acids tormentic acids tormentic acid and 2alpha-hydroxyursolic acid have been isolated from the dried leaves of *A.euchroma* and identified.

9204-2637 Yao, X.S., Ebizuka, Y., Noguchi, H., Kiuchi, F., Shibuya, M., Iitaka, Y., Seto, H., Sankawa, U.* (Faculty

of Pharmaceutical Sciences, The University of Tokyo, 7-3-1, Hongo, Bunkyo-ku, Tokyo 113, Japan) **Biologically active constituents of *Arnebia euchroma*: Structure of arnebinol, an ansa-type monoterpenylbenzenoid with inhibitory activity on prostaglandin biosynthesis.** *Chemical & Pharmaceutical Bulletin*, v. 39(11): p. 2956-2961, 1991 (14 ref, Eng).

Three phenolic compounds were isolated from the roots of *A. euchroma* as inhibitors of in vitro prostaglandin biosynthesis. Two known compounds were identified as shikonofurans and des-O-methylsiasiodiplodin. The other new compound was named arnebinol and its structure was elucidated as a novel ansa-type monoterpenylbenzenoid derivative.

9204-2638 Yao, X.S., Ebizuka, Y., Noguchi, H., Kiuchi, F., Shibuya, M., Iitaka, Y., Seto, H., Sankawa, U.* (Faculty of Pharmaceutical Sciences, The University of Tokyo, 7-3-1, Hongo, Bunkyo-ku, Tokyo 113, Japan) **Biologically active constituents of *Arnebia euchroma*: Structures of new monoterpenylbenzoquinones: Arnebinone and arnebifuranone.** *Chemical & Pharmaceutical Bulletin*, v. 39(11): p. 2962-2964, 1991 (10 ref, Eng).

Two quinonic compounds, arnebinone and arnebifuranone, were isolated from the roots of *A. euchroma* and their structures were elucidated on the basis of spectral evidence. Arnebinone is a monoterpenyl-benzoquinone in which the monoterpenoid moiety forms a fused ring to the benzoquinone. Arnebifuranone is another monoterpenyl-benzoquinone with a furan ring containing side chain which is bonded to the benzoquinone at the head carbon of C10 moiety originating from the geranyl moiety of geranylhydroquinone.

9204-2639 Yi, Y.H., Xu, C.R. (School of Pharmacy, Second Military Medical University, 101 Guo He Road, Shanghai 200433, China) **Studies on the constituents from *Panicum repens*.** *7th Asian Symposium Med. Plants, Spices, and Other Natural Prod. (ASOMPS VII). Manila, 2-7 February 1992* (2 ref, Eng).

The roots and rhizomes of *P. repens* have afforded diosgenin and a new lignan named. Panicunin (10H20O4 colorless needles; m.p.278.5-279.5 degrees). The positive cotton effect at 215 nm in the CD spectrum of panicunin indicated that 2alpha, 3beta-gamma-lactone was present. (Abstr.No. MP-6).

9204-2640 Yi, Y.H. (School of Pharmacy, Second Military Medical University, 101 Guo He Road, Shanghai 200433, China) **Three new saponins from *Phytolacca esculenta*.** *7th Asian Symposium on Med. Plants, Spices, and Other*

Natural Prod. (ASOMPS VII). Manila, 2-7 February 1992 (Eng).

The roots of *P. esculenta* (chinese name Shang Lu) have been used in traditional Chinese medicine for the treatment of tumors, edema and bronchitis in China. The saponins from the roots of this plant showed considerable activities of inducing immune interferon (IFN-r), interleukin-2(IL-2), lymphotoxin (LT) and tumor necrosis factor (TNF) as well as potent anti-inflammatory activities. The structural elucidation of three new saponins, esculentoside G, esculentoside 1 and esculentoside N. have been reported. (Abstr.No. TO-4).

9204-2641 Yoshida, T., Ahmed, A.F., Memon, M.U., Okuda, T. (Faculty of Pharmaceutical Sciences, Okayama University, Tsushima, Okayama 700, Japan) **Tannins of Tamaricaceous plants. II. New monomeric and dimeric hydrolyzable tannins from *Reaumuria hirtella* and *Tamarix pakistanica*.** *Chemical & Pharmaceutical Bulletin*, v. 39(11): p. 2849-2854, 1991 (18 ref, Eng).

Two new monomeric hydrolyzable tannins (remurins A and B) and a new dimer (dhrellin A, have been isolated from *R. hirtella* Hirtellin A and an additional new dimeric hydrolyzable tannin, tamarixinin A, along with three known tannins including hirtellin B, have also been isolated from *T. pakistanica*. The structures of the new tannins have been elucidated based on chemical method and two-dimensional nuclear magnetic resonance analyses including 1H-13C long-range shift correlation spectroscopy.

9204-2642 Young, M.C.M., Vieira, C.C.J., Chu, E.P., Haraguchi, M., Figueiredo-Ribeiro, R.C.L.* (Secao de Fisiologia e Bioquimica de Plantas, Instituto de Botanica de Sao Paulo, CP 4005,01051, Sao Paulo, SP, Brazil) **Ecdysterone and saponins from tuberous roots of *Gomphrena officinalis* Mart. (Amaranthaceae).** *Revista Latinoamericana de Quimica*, v. 22(4)+23(1): p. 41-44, 1992 (8 ref, Eng).

Ecdysterone and chikusetsusaponin IV a were isolated from tuberous roots of *G. officinalis* and characterized. Phenological fluctuations in saponin and sapogenin contents were also described.

9204-2643 Yuan, J.L., Lu, Z.Z., Chen, G.X., Ding, W.P., Zhou, B.N., Erdelmeier, C.A.J., Hamburger, M.O., Fong, H.H.S., Cordell, G.A. (Family Planning Research Institute, Tong-ji Medical University, Wuhan 430030, People's Republic of China) **The pregnane glycoside marsdekoiside a from *Marsdenia koi*.** *Phytochemistry*, v. 31(3): p. 1058-1060, 1992 (8 ref, Eng).

A new pregnane glycoside, marsdekoiside A was isolated from the stems of *M. koi* and its structures was

elucidated from chemical and spectral data as 12-cinnamoyl-dihydrosarcostin-3-O-methyl-6-deoxy-beta-D-allopyranosyl- (4)-O-beta-D-oleandropyranosyl-(1-4)-O-beta-D-cymaropyranoside.

9204-2644 Zafar, R., Aeri, V.(Department of Pharmacognosy and Phytochemistry, Faculty of Pharmacy, Jamia Hamdard, Hamdard Nagar, New Delhi 110062, India) **Constituents of *Tribulus terrestris* flowers.** *Fitoterapia*, v. 63(1): p. 90, 1992 (7 ref, Eng).

Diosgenin, hecogenin, ruscogenin, spirosta-3,5-diene, steroid sapogenin, kaempferol and quercetin were isolated from *T.terrestris* flowers.

9204-2645 Zapesochnaya, G., Kurkin, V., Okhanov, V., Miroshnikov, A.(All Union Research Institute of Medicinal Plants (VILR) ul. Grina 7, 113628 Moscow, USSR) **Canthin-6-one and beta-carboline alkaloids from *Aerva lanata*.** *Planta Medica*, v. 58(2): p. 192-196, 1992 (23 ref, Eng).

From the herb of *A.lanata* six alkaloids were isolated. Cathin-6-one and beta-carboline-1-propionic acid have been found previously while 10-methoxy-canthin-6-one, 10-hydroxy-canthin-6-one, 10-O-beta-D-glucopyranosyloxycanthin-6-one, 6-methoxy-beta-carboline-1-propionic acid are new alkaloids. Their structures were determined by means of spectroscopic analysis and chemical transformations.

9204-2646 Zhang, J., He, L.X., Xue, H.Z., Feng, R., Pu, Q.L. (Nanjing Research Institute of Wild Plants, Nanjing 210042, China) **The structure of versicolactone a from *Aristolochia versicolor* S.M.Hwang.** *Acta Pharmaceutica Sinica*, v. 26(11): p. 846-851, 1991 (5 ref, Eng, Jap).

A novel sesquiterpene lactone, versicolactone A (C₁₅H₂₀O₂, mp 130-132 degree C) with 12-carbon ring skeleton, was isolated from the roots of *A.versicolor*. Its structure was established by spectroscopic methods, mainly 2D-NMR (1H-1H COSY, 1H-13C COSY, COLOC), HRMS and metastable ion measurement.

9204-2647 Zhang, Y.W., Xue, Z.(China-Japan Friendship Institute of Clinical Medical Sciences, Beijing 100029, China) **Studies on the chemical constituents of *Dipsacus asper* Wall.** *Acta Pharmaceutica Sinica*, v. 26(9): p. 676-681, 1991 (6 ref, Eng, Jap).

Six compounds I-VI were isolated from the roots of *D.asper* compounds I,II,III and VI were identified as sucrose, daucosterol, beta-sitosterol and akebia saponin D, respectively. On the basis of spectral analysis and chemical evidence, the structures of two new compounds were established as 3-O-(4-O-acetyl)-alpha-L- arabinopyranosyl-

hederagenin 28-O-beta-D-glucopyranosyl-(1 to 6)-beta-D-glucopyranoside (IV) and 3-O-alpha-L-arabinopyranosyl oleanolic acid 28-O-beta-D-glucopyranosyl-(1 to 6)-beta-D-glucopyranoside (V).

9204-2648 Zhou, J., Zou, C., Tan, N.H., Zhao, S.X.(Laboratory of Phytochemistry, Kunming Institute of Botany, Kunming, China) **Bioactive cyclopeptides from *Rubia yunnanensis* and *pseudostellaria heterophylla*.** *7th Asian Symposium on Med. Plants, Spices and Other Natural Prod. (ASOMPS VII).* Manila, 2-7 February 1992 (Eng).

Methanol extract of the root of *R.yunnanensis* (xiao hong snem a folk antitumor remedy in Yunnan) afforded a new glycocyclopeptide (RY-1) and deoxybenvadin (RA-V) a cyclohexapeptide, both possessing antitumor activities. The root of *P.heterophylla* (tai zi Shen, a Chinese tonic) afforded heterophyllin A (0.0015 percent) and heterophyllin B (0.0048 percent), and identified as cycloheptapeptide and cyclooctapeptide respectively. (Abstr.No. TO-13).

9204-2649 Zhou, L.G., Zheng, G.Z., Gan, F.Y., Wang, S.L., Yang, C.R., Xu, C.(Kunming Institute of Botany, Academia Sinica, Kunming 650204, China) **Separation and identification of main medicinal saponin components from mass cell cultures of *Panax notoginseng* (Burk) F.H. Chen.** *Acta Pharmaceutica Sinica*, v. 26(11): p. 876-880, 1991 (7 ref, Jap, Eng).

Five main saponins were separated from the cell cultures of *P.notoginseng*. They were sanchinoside Rb1, Re, R1, Rg1 and Rh1 identified by TLC, HPLC, IR, M.P. 13CNMR and EI-MS. Saponin components of the cell cultures were almost the same as those of the cultivated plants. But the content of saponins was different between the cell cultures and the cultivated plants. Saponin extraction and separation procedure suitable for the cell cultures has to be different from that for the cultivated plants.

9204-2650 Zobel, A.M., Brown, S.A., March, R.E.(Department of Chemistry, Trent University, Peterborough, Ont., Canada K9J 7B8) **Histological localization of psoralens in fruits of *Psoralea bituminosa*.** *Canadian Journal of Botany*, v. 69(8): p. 1673-1678, 1991 (27 ref, Fre, Eng).

Linear furanocoumarins were found on the surface of *P.bituminosa* fruits in concentrations up to 1 percent of the total furanocoumarins. Most of the remainder was on the surface of the embryos and very young seedlings, with ca. 4 percent of the total furanocoumarins within the embryos, and very little in the seed coat and fruit. Psoralen was present in the highest concentration, over twice that of xanthotoxin. There was very little bergapten, whose distribution differed from that of the xanthotoxin and psoralen, ca. 20 percent

being on the surface and the rest in dead tissues, fruit and seed covers. Evidence was obtained, through autofluorescence, that these coumarins are localized in discrete cells of the embryo, on the embryo surface, and on the fruit surface.

Chemotaxonomy

9204-2651 Boustie, J., Gleye, J., Blaise, A., Fouraste, I.* (Laboratoire de Pharmacognosie, Faculte de Pharmacie, 31 Allee Jules-Guesde, F-31400 Toulouse, France) **Limonoids of *Fagaropsis glabra*.** *Planta Medica*, v. 58(2): p. 228, 1992 (10 ref, Eng).

Dictamdiol (a degraded limonoid), limonin, rutaeoin evodol, 12-alpha-hydroxyrutaevine have been isolated from the stem bark of *F. glabra*. Chemotaxonomy of the plant has been discussed.

9204-2652 Brophy, J.J., Clarkson, J.R. (Department of Organic Chemistry, University of New South Wales, PO Box 1, Kensington, NSW 2033) **The leaf essential oils of the genus *Neofabricia* (Myrtaceae).** *7th Asian Symposium on Med. Plants, Spices and Other Natural Prod. (ASOMPS VII)*. Manila, 2-7 February 1992 (Eng).

The genus *Neofabricia* has recently been erected to accommodate species which were included under *Leptospermum*. The genus contains three species, viz., *N.myrtifolia*, *N.mjoebergii* and *N.sericisepala* all of which are endemic to the Cape York peninsula. The oils of all three species were found to be terpenoid in character. *N.mjoebergii* was mainly sesquiterpenoid in character with caryophyllene and humulene, along with beta-pinene. *N.sericisepala* contained over 50 percent alpha-pinene with the next most abundant component being caryophyllene. *N.myrtifolia* appeared to exist in two chemical forms, one of which contained alpha-pinene at over 60 percent as the major component and lesser amount of caryophyllene. The second chemical form contained only small amounts of alpha-pinene and larger (up to 60 percent) of caryophyllene. There are 79 species of *Leptospermum* known. The oil composition of the three *Neofabricia* species differs from known *Leptospermum* oil in that the *Neofabricia* oils contain large amounts of caryophyllene which is not a characteristic compound of the, so far examined, *Leptospermum* oils. The results so far would seem to support the erection of a separate genus for the three species of *Neofabricia* (Abstr. No. MP-7).

9204-2653 Chalchat, J.C., Garry, R.P., Michet, A., Gorunovic, M., Stosic, D. (University Blaise Pascal, Clermont, Organic Chemistry 2, Chemistry of Essential Oils, POB 45, Aubiere, France) **A contribution to chemotaxonomy of *Artemisia annua* L. Asteraceae.** *Acta*

Pharmaceutica Jugoslavica, v. 4(3): p. 233-236, 1991 (9 ref, Eng).

Dried aerial parts of the plant yielded essential oil (1.10 percent), whereas fresh parts of the plant yielded 0.38 percent of essential oils. Forty-seven constituents were identified in the oil and their percentage was determined. The main constituents were artemisia-ketone (52.50 percent), 1,8-cineole (11.66 percent) and camphor (10.90 percent). The chemotaxonomic classification of this species in *Artemisia* genus was proposed according to main component, artemisia-ketone.

9204-2654 Duchen U.E.P., de Jimenez, L.B., Conserva, L., Yoshida, M., Gottheb, O.R. (Facultad de Ciencias Puras Y Naturales, Universidad Mayor de San Andres, La Paz, Bolivia) **Pyrones from *Aniba muca*.** *Revista Latinoamericana de Quimica*, v. 22(3): p. 55-56, 1991 (11 ref, Eng).

Benzylbenzoate and four 4-methoxy-2-pyrones substituted at position 6 by phenyl-piperonyl-,trans-styryl-and 3,4-dimethoxy-trans-styryl-groups have been isolated from fine branches and trunk wood of *A.muca*. This chemical constitution suggests the species to occupy a relatively advanced position in the genus.

9204-2655 Dukic, N.M., Husain, S.Z., Jancic, R., Gasic, O., Loukis, A., Khan, M.B. (School of Plant Sciences, Plant Science Laboratories, University of Reading, Whiteknights, Reading RG6 2AS, UK) **Composition and variation of essential oil constituents in three *Mentha* L., (Labiatae) species in Yugoslavia.** *Pakistan Journal of Botany*, v. 23(2): p. 243-248, 1991 (17 ref, Eng).

Essential oil components piperitone, linalool, menthol, geraniol, limonene, carvone, pulegone, caryophyllene, menthone, isomenthone, neoisomenthone, cymene, borneol and piperitenone were determined by GLC in *Mentha arvensis*, *M.longifolia* and *M.spicata*. Consideration variation was observed among some essential oil compounds.

9204-2656 El Imam, Y.M.A., Evans, W.C., Haegi, L., Ramsey, K.P.A. (Faculty of Pharmacy, University of Khartoum, Sudan) **Secondary metabolites of intergeneric hybrids of the Anthocercideae, family Solanaceae.** *International Journal of Pharmacognosy*, v. 29(4): p. 263-267, 1991 (14 ref, Eng).

The tropane and pyridine alkaloids contents in the aerial parts of three putative hybrids of the tribe Anthocercideae, family Solanaceae have been reported. The cross *Cyphanthera albicans* x *Duboisia myoporoides* contains the principal alkaloids of both parents, present in an amount in excess of that normally encountered in *Cyphanthera*. The hybrid *C.myosotidea* x *Grammosolen dixonii* is inter-

mediate between the parents in alkaloids content; the principal base is 6-hydroxyhyoscyamine (a) minor constituent of *C.myosotidea*. A mixture of both tropane and pyridine alkaloids is reported in the hybrid *D.hopwoodii* x *G.dixonii*. Ursolic acid has been identified in all specimens of parents and hybrids. The phytochemical results support the botanical deductions concerning the parentage of the three hybrids. Hyoscine is reported for the first time as a component of the alkaloid mixture of the aerial parts of *D.hopwoodii*.

9204-2657 Ibrahim, H., Hussin, K.H., Sanusi, A.(University Malaya, Malaysia) **Taxonomic implications of isozyme and anatomical studies on Curcuma spp. Zingiberaceae Workshop, Prince of Songkla University, Hat Yai, Thailand**, p. 12, 15-18 Oct. 1991 (Eng).

Anatomical and isozyme studies were carried out on *Curcuma aurantiaca*, *C.domestica*, *C.mangga*, *C.xanthorrhiza* and *C.zedoaria*. The isozyme banding pattern for peroxidase showed variation between species and revealed some taxonomic implication for *C.xanthorrhiza* and *C.zedoaria* which are morphologically similar in their vegetative features. The anatomical results showed that the five species studied can be differentiated by the shape of the midrib and petiole in cross sections, the number of type IV bundles in the leaf and petiole, and the number of secondary and tertiary bundles. (Abstr.No. 1050-1110).

9204-2658 Nash, R.J., Beaumont, J., Veitch, N.C., Reynolds, T.*., Benner, J., Hughes, C.N.G., Dring, J.V., Bennett, R.N., Dellar, J.E. (Jedrell Laboratory, Royal Botanic Gardens, Kew, Richmond, Surrey, UK) **Phenylethylamine and piperidine alkaloids in Aloe species.** *Planta Medica*, v. 58(1): p. 84-87, 1992 (22 ref, Eng).

Of the approximately 300 species of Aloe native to Africa and Arabia, leaf extracts of 224 species have been examined chromatographically for alkaloids using ninhydrin, Dragendorff's reagent, nitroprusside, and iodoplatinate as revealing agents. From these, 48(21 percent) species contained compounds giving a strong colorimetric reaction with at least one of these reagents. Tyramine derivatives were identified in 18 species and piperidine derivatives in a further 6 species. The other coloured zones remain unidentified but often appeared to represent common amino acids. Some taxonomic correlations are suggested.

9204-2659 Nian, L.(South China Institute of Botany, China) **The peroxidase isoenzyme of Curcuma and Alpinia.** *Zingiberaceae Workshop, Prince of Songkla University, Hat Yai, Thailand*, p. 9, 15-18 Oct. 1991 (Eng).

By means of disc polyacrylamide gel electrophoresis, the isozyme of superoxide dismutase and peroxidase of 11 species of Chinese *Curcuma* were analyzed. The genus was divided into sections on the basis of two kinds of isozymes. According to the zymogram and the rhizome colours of Curcuma, these 11 species could be divided into 3 groups. 1. Rhizomes yellow, red to dark red coloured in species *C.longa*, *C.aromatica* and *C.xanthorrhiza*. 2. Rhizomes greyish white or pale grey coloured contain *C.kwangsiensis*, *C.elata* and *wenyujin*. 3. Rhizomes pale green and pale yellow or green to dark green coloured contains *C.phacocaulis*, *C.exigua* and *C.yunnanensis*. (Abstr.No. 0900-09200).

9204-2660 Oza, R.A.(Sir P.P.Institute of Science, Bhavnagar University, Bhavnagar-364002, India) **Chemical taxonomy of some species of Rutaceae from Gujarat-India.** *7th Asian Symposium Med. Plants, Spices, and Other natural Prod. (ASOMPS VII)*, Manila, 2-7 February 1992 (Eng).

The family Rutaceae is represented by 6 genera *Aegle*, *Citrus*, *Glycosmis*, *Limonia*, *Murraya* and *Ruta* and 13 species in the state. These species have been tabulated giving their morphological characters botanical and common english names duration of existance, habit, chemical composition, flowering and fruiting period, life forms description of individual species and their economic importance. The economically important species most frequently accounted are *Aegle marmelos*, *Limonia acidissima*, *Murraya koenigii* and varieties of cultivated *Citrus* sp.. (Anstr.No. WB-9).

9204-2661 Rakotomalala, J.J.R., Cros, E., Clifford, M.N., Charrier, A.(Laboratoire de Ressources Genetiques et d'Admelioration des Plantes Tropicales, ORSTOM BP 5045, 34032 Montpellier Cedex, France) **Caffeine and theobromine in green beans from Mascarocoffeea.** *Phytochemistry*, v. 31(4): p. 1271-1272, 1992 (15 ref, Eng).

The presence of theobromine (upto 0.14 percent) and of caffeine (upto 0.76 percent) has been established for the first time in beans from two populations of *C.lancifolia* (A320 and A405) and in one population of *C.kianjavatensis* (A213). This indicates that the *Mascarocoffeea*, once thought upto be purine-free, includes some members storing methyl xanthines in seeds, but the virtual absence of caffeine from another *C.kianjavatensis* (A602), and of both caffeine and theobromine from three populations of *C.homolei* (A574, A743 and SZ108) indicates the biochemical diversity of these taxa.

9204-2662 Suvachittanont, W.(Prince of Songkla University, Thailand) **Characterization of some species of the genus Kaempferia using isozyme electrophoresis.** *Zin-*

giberaceae Workshop, Prince of Songkla University, Hat Yai, Thailand, p. 11, 15-18 Oct. 1991 (Eng).

An attempt has been made to compare some of the gene products in two morphotypes of *K. galanga* viz., proh-hom and jangang using isozyme (isoenzyme) electrophoresis. Proh-hom showed three superoxide dismutase bands whereas jangang showed only two bands. Esterases in proh-hom showed two bands while jangang showed only one band. These findings suggested that proh-hom and jangang should be regarded as different species since they exhibit different gene products. (Abstr. No. 1000-1020).

9204-2663 Umemoto, K., Tsuneya, T. (Laboratory of Chemistry, Nagoya Gakuin University, Kamishinano-Chu, Seto, 480-12, Japan) **Chemotypes of self-pollinating species of *Mentha arvensis*. Studies on chemical constituents of wild mints. Part 15. *Nippon Nogeikagaku Kaishi*, v. 64(9): p. 1467-1469, 1990 (5 ref, Eng, Jap).**

Chemotypes of 26 SLS from self-pollinating *M. arvensis* growing wild in the Tosa area have been investigated. These SLS were grouped mainly into three different chemotypes by comparing the oil content at flowering time in August 1988 with that of the parent *arvensis*. The chemotypes of 10 SLS was very similar to that of the parent plant. Another 10 SLS contained little menthol and related compound, although they could be grouped into the piperitenone oxide-piperitone oxide type, such as the parent. On the contrary, the chemotypes of 6 SLS was composed of menthol and pulegone as the main components and contained little piperitenone oxide and piperitone oxide. JICST, Tokyo.

9204-2664 Waterman, P.G. (Phytochemistry Research Laboratories, Department of Pharmaceutical Sciences, University of Strathclyde, Glasgow G1 1XW, Scotland) **Chemical systematics within the order Rutales. 7th Asian Symposium on Med. Plants, Spices, and Other Natural Prod. (ASOMPS VII). Manila, 2-7 February 1992 (Eng).**

The Rutales (Rutaceae, Meliaceae, Simaroubaceae and attendant small families) produces an enormous array of secondary metabolites e.g. (a) alkaloids derived from tyrosine, anthranic acid, tryptophan and histidine; (b) coumarins, chromones, acetophenones and polyoxygenated flavonoids; (c) limonoids and quassinooids produced by modification of a triterpene triterpene skeleton. The distribution of a number of secondary metabolites acts as useful taxonomic indicators. The biogenetic origins of the compounds and their systematic value have been discussed. (Abstr. No. WB-2).

Ethnomedicine

9204-2665 Abegaz, B.M. (Department of Chemistry, Addis Ababa University, PO Box 1176, Addis Ababa, Ethiopia) **Chemistry of culturally important plants from Ethiopia. 7th Asian Symposium on Med. Plants, Spices and Other Natural Prod. (ASOMPS VII). Manila, 2-7 February 1992 (Eng).**

The people of Ethiopia, have, through several century-old practices, developed special uses of plants for a variety of purposes. Many plants are used as medicine and other plants are used as flavor, fragrance and as insecticides. Plants that have been investigated recently in the Natural Products Program of the Chemistry Department in Addis have been presented. These include the purgative *Senna* (Fabaceae) spp., the food legume *Lathyrus sativus* and the popular anthelmintic plant *Selsola somalensis*. (Abstr. No. TO-1).

9204-2666 Aminuddin, Girach, R.D. (Survey of Medicinal Plants Unit, Regional Research Institute of Unani Medicine, Bhadrak 756100, India) **Ethnobotanical studies on Bondo tribe of district Keraput, Orissa, India. Ethnobotany, v. 3(1&2): p. 15-19, 1991 (11 ref, Eng).**

First hand information on various aspects of ethnobotany relating to 44 plant species of 31 families is presented. Plant species are enumerated alphabetically with their botanical name, family, tribal name, locality and voucher specimen number. Plant specimen are deposited in the unit herbarium, NSL, New Delhi.

9204-2667 Bhattarai, N.K. (National Herbarium and Plant Laboratories, Department of Forestry and Plant Research, Gidawary, Lalitpur, Nepal) **Folk herbal medicines of Makawanpur district, Nepal. International Journal of Pharmacognosy, v. 29(4): p. 284-295, 1991 (4 ref, Eng).**

A study on the traditional phytotherapy in Makawanpur district, Central Nepal revealed that it is still the method of choice to treat the majority of frequently occurring ailments. Information on 86 plant species with 120 empirically accepted prescriptions for therapeutic doses along with medicinal applications of each species are presented.

9204-2668 Caceres, A., Freire, V., Giron, L.M., Aviles, O., Pacheco, G. (Centre for Mesoamerican Studies on Appropriate Technology, PO Box 1160, Guatemalan City, Guatemala) ***Moringa oleifera* (Moringaceae): Ethnobotanical studies in Guatemala. Economic Botany, v. 45(4): p. 522-523, 1991 (12 ref, Eng).**

Based on a survey of six departments, an account of *M. oleifera*, its local names (18 names), various uses, medicinal importance, agronomic studies, etc., has been

given. It is suggested that the tree should also be used as part of reforestation programme.

9204-2669 Dung, N.X., Lo, V.N., Thuan, P.D., Leclercq, P.A. (Faculty of Chemistry, 19 La Thanh Tong Street, 10000 Hanoi, vietnam) **Contribution to the study of medicinal plants and spices from Vietnam.** *7th Asian Symposium on Med. Plants, Spices and Other Natural Prod. (ASOMPSVII).* Manila, 2-7 February 1992 (Eng).

More than 80 percent of the population in Vietnam uses traditional medicine and spices. Recent developments in the study of medicinal plants and spices from Vietnam are described. Chemical and pharmacological studies have yielded valuable results in the identification and processing of biologically active compounds, and in the evaluation of traditional medicinal plants and spices as sources of pharmaceuticals and foodstuff. (Abstr. No. TP-8).

9204-2670 Fantz, P.R. (Department of Horticultural Science, North Carolina State University, Raleigh, NC 27695-7609, USA) **Ethnobotany of *Clitoria* (Leguminosae).** *Economic Botany*, v. 45(4): p. 511-520, 1991 (68 ref, Eng).

Based upon literature reports and label data obtained from examination of over 8000 herbarium vouchers, economic uses of *Clitoria* species are summarised. Most reports are for an African species viz., *C. ternata*. Economic data for 23 species have been recorded.

9204-2671 Haji Mohiddin, M.Y., Chin, W., Holdsworth, D. (Department of Agriculture, Bandar Seri Begawan, Brunei Darussalam) **Traditional medicinal plants of Brunei Darussalam part II. Sengkurong.** *International Journal of Pharmacognosy*, v. 29(4): p. 252-258, 1991 (22 ref, Eng).

Traditional medicinal uses of thirty plants used by the Kadayan Malays in the Sengkurong district of Brunei Darussalam have been enlisted.

9204-2672 Holdsworth, D. (Chemistry Department, Universiti Brunei Darussalam, Gadong 3186, Brunei) **Traditional medicinal plants of Brunei Darussalam. Part I. Bukit Udal.** *International Journal of Pharmacognosy*, v. 29(4): p. 245-250, 1991 (32 ref, Eng).

Twenty nine plants are listed alphabetically along with their family, vernacular names, therapeutic uses and known chemical constituents.

9204-2673 Hozagoundar, V.B., Henry, A.N. (Botanical Survey of India, Southern Circle, Coimbatore, 641003, TN, India) **Ethnobotany of *Prosopis cineraria***

(Mimosaceae). *Ethnobotany*, v. 3(1&2): p. 47-49, 1991 (1 ref, Eng).

'Banni mera' or 'Banni gida' are especially used in northern Karnataka in religious pursuits and beliefs. Leaf paste are applied on boils and blisters, including mouth ulcers in livestock. Juice is used as a vermicide orally. NSL, New Delhi.

9204-2674 Ibrahim, H. (University Malaya, Malaysia) **Edible gingers of Malaysia.** *Zingiberaceae Workshop, Prince of Songkla University, Hat Yai, Thailand*, p. 24-25, 15-18 Oct. 1991 (Eng).

Village folk of Malaysia, particularly those in remote, undeveloped areas, have for generations exploited the local flora, often exhausting the forest of food and medicinal plant resources. Of the estimated 330 to 350 species of Zingiberaceae in Malaysia, approximately 13 percent are reported to be edible, representing some 40-50 species from 13 genera including *Costus*. Parts used and relevant description of plants from East and West Malaysia have been described and discussed.

9204-2675 Jain, S.K. (National Botanical Research Institute, UP, India) **Zingiberaceae in India: Ethnobotanical diversity.** *Zingiberaceae Workshop, Prince of Songkla University, Hat Yai, Thailand*, p. 18, 15-18 Oct. 1991 (Eng).

The ethnobotanical diversities of *Curcuma amada*, *C. angustifolia*, *C. aromatica*, *C. longa*, *C. neilgherrensis*, *C. pseudomontana* and *C. zedoaria*, the root of *Hedychium acuminatum*, *H. gracile*, *H. spicatum* and rhizome of *Zingiber officinale* in different parts of India have been discussed. (Abstr. No. 1440-1500).

9204-2676 Kumbhojkar, M.S., Kulkarni, D.K., Upadhye, A.S. (Department of Botany, MACS Research Institute, Pune 411004, Maharashtra, India) **Ethnobotany of *Cissus quadrangularis* L. from India.** *Ethnobotany*, v. 3(1&2): 21-25, 1991 (15 ref, Eng).

The paper reports the ethnobotanical records on the species *C. quadrangularis* in Indian context. This species with peculiar morphological features has been in use in India since long for edible, and medicinal purposes and is of considerable ethnobotanical significance. NSL, New Delhi.

9204-2677 Leaman, D.J. (University of Ottawa, Canada) **Notes on some medicinal Zingiberaceae of the Apo Kayan Plateau, East Kalimantan.** *Zingiberaceae Workshop, Prince of Songkla University, Hat Yai, Thailand*, p. 25, 15-18 Oct. 1991 (Eng).

An inventory of traditional medicines known to and used by healers in three Kenyah villages in the Apo Kayan Plateau region of East Kalimantan resulted in the identification of more than 200 plant species and five animal species used to treat at least 65 distinct health problems. The collection included 20 species of Zingiberaceae, the largest family of Kenyah medicinal plants.

9204-2678 Mangaly, J.K., Sabu, M.(University of Calicut, Kerala, India) **Ethnobotany of Zingiberaceae.** *Zingiberaceae Workshop, Prince of Songkla University, Hat Yai, Thailand*, p. 24, 15-18 Oct. 1991 (Eng).

The uses of rhizomes of *Alpinia galanga*, *Curcuma longa*, *Kaempferia galanga* and *Zingiber officinale* and seeds of *Elettaria cardamomum* have been given. They were extensively used in India in ancient times for various purposes including use as ingredients of Ayurvedic preparations in skin disorders, rheumatism etc.

9204-2679 Ong, H.C.* , Ibrahim, H., Hassan, R.(University of Malaya, Malaysia) **Ethnobotanical survey of gingers in selected Malay villages.** *Zingiberaceae Workshop, Prince of Songkla University, Hat Yai, Thailand*, p. 17, 15-18 Oct. 1991 (Eng).

100 households in 11 villages were randomly selected in two states, namely Kelantan and Selangor, each representing east and west parts of Peninsular Malaysia, respectively. A relevant questionnaire was set and members of each household were interviewed accordingly. The usefulness of Zingiberaceous species and their importance in traditional medicine were recorded. Results of the survey revealed that of the 180 species of Zingiberaceae, at least 16 species are being used for food, medicine, spices, condiments, colouring matters (dyes), and rituals associated with beliefs, customs and traditions. Of the 16 useful gingers, all are known to be cultivated species grown mostly in home gardens except for *Alpinia conchigera* which can be found wild (growing among the belukar) as well as cultivated. Of these, 13 species are reportedly introduced and 3 species native to Peninsular Malaysia. (Abstr. No. 1420-1440).

9204-2680 Prakash, V., Mehrotra, B.N.(Botany Division, CDRI, Lucknow 226001, UP, India) **Ethno-Medicinal uses of some plants among garos of Meghalaya.** *Ethnobotany*, v. 3(1&2): p. 41-45, 1991 (18 ref, Eng).

Native medicinal uses of 20 plants common among Garo tribe in Rongrengiri area of Meghalaya are reported. These plants have either not been mentioned by earlier workers or their uses mentioned here are new. Results of biological screening of nine of these plants are also available.

9204-2681 Reddy, M.B., Reddy, K.R., Reddy, M.N.(Department of Botany, Sri Venkateswara University, Tirupati 517502, AP, India) **Ethnobotany of Cuddapah district, Andhra Pradesh, India.** *International Journal of Pharmacognosy*, v. 29(4): p. 273-280, 1991 (5 ref, Eng).

An ethnobotanical exploration was carried out from 1985 to 1987 in Cuddapah District of Andhra Pradesh, one of southern states of India. In this report, information on forty five species belonging to thirty five families, used in traditional medicine by local tribal people (the Yanadis, Yerukalas, Sugalis, and Chenchus) for treating different ailments is presented.

9204-2682 Sharma, V., Sharma, A.(Department of Community Medicine, Pramukh Swami Medical College and Hospital, Karam Sad 388325, Gujarat, India) **Family planning practices among tribals of South Rajasthan-India.** *Journal of Research and Education in Indian Medicine*, v. 10(4): p. 5-9, 1991 (21 ref, Eng).

Most of the tribals are ignorant of modern techniques of family planning. Some traditional methods such as vaginal douches, using certain herbal solutions, lime juice, vinegar, alum solution, besides some other methods are in vogue among the tribals. However, socio-cultural practices play an important role in family planning..

9204-2683 Vera, R., Mondon, J.M., Pieribattesti, J.C.(Laboratoire d'Agrochimie-Faculte des Sciences-Universite de La Reunion-BP 5-97490 Sainte-Clotilde-Reunion (F)) **Some medicinal plants of reunion.** *7th Asian Symposium on Med. Plants, Spices, and Other Natural Prod. (ASOMPS VII). Manila*, 2-7 February 1992 (Eng).

Essential oils of three medicinal plants were investigation by GLS and MS. These plants *Ageratum conyzoides* used in folk medicine grow wild throughout Reunion and other tropical countries. Juice of *Plectranthus* leaves is used for curing wounds. An infusion is said to possess anti-influenza properties. Main constituents of *Plectranthus* essential oil are: 3 carene, 8 terpinene, camphor, carvacrol, beta caryophyllene. The juices of the leaves and stem of *Ageratum* are used for curing wounds, boils and skin diseases. An infusion is considered to be an anti-inflammatory to alleviate stomach diseases. Main constituents of *Ageratum* essential oil are: Precocene 1, Bornyl acetate, B caryophyllene, humulene, cadinene. Iboza leaves are used as inhalant to alleviate sinusitis and influenza. Main constituents of Iboza essential oil are: cadinol, aromadendrenepoxyde, B eudesmol, B caryophyllene, Ibozol. (Abstr. No. MP-8B).

Analytical & Processing Techniques

9204-2684 Abrantes, F., Guevara, B.Q. , Villaraza, C.M.(Research Center for the Natural Sciences, UST, Philippines) **Biologically active constituents in Tabernaemontana pandacaqui Poi.** *7th Asian Symposium on Med. Plants, Spices and Other Natural Prod.(ASOMPS VII).* Manila, 2-7 February 1992 (3 ref, Eng).

T.pandacaqui was chosen for further investigation on the basis of its ethnic use as a medicinal plant. The isolation, purification and structure elucidation of the compound found to be biologically active, has been described. A modified bioautographic method was used to detect the anti-bacterial constituents. The dried leaves were subjected to alcoholic extraction and fractionated into the chloroform soluble and butanol soluble constituents. A bioactive constituent was detected on the butanol fraction against *B. subtilis* using the *seid* method. A bio-directed isolation was then conducted using different chromatographic methods. (Abstr. No. WP-17).

9204-2685 Colegate, S.M., Dorling, P.R. , Huxtable, C.R.(School of Veterinary Studies, Murdoch University Murdoch, Western Australia, 6150) **Investigation of plants that poison livestock.** *7th Asian Symposium on Med. Plants, Spices and Other Natural Prod. (ASOMPS VII).* Manila, 2-7 February 1992 (Eng).

The effect of a plant on an animal can form the basis of a bioassay specific for the causative toxins. The active constituents can then be isolated using this specific assay in a bioactivity guided fractionation of the plant extracts. This methodology has been employed to isolate causative toxins from several west Australian plants and pharmacological assays done, eg *Swainsona canescens*. (Abstr.No. TO-21).

9204-2686 Curtiss, H.(Pepsi Cola, R&D Technical Service Center, 100 Stevens Avenue, Valhalla, NY 10595, USA) **Application of computers to the flavor development process.** *Perfumer & Flavorist*, v. 17(2): p. 23-25, 1992 (1 ref, Eng).

Use of computer program to develop strawberry flavour from bitter almond oil, gamma-undecalactone, gamma-nonalactone and ethanol as solvent has been demonstrated.

9204-2687 Drost-Karbowska, K., Szaufier-Hajdrych, M.(Katedra i Zaklad Farmakognozji, Akademia Medyczna w K.Marcinkowskiego, Ul.Sieroca 10, 61-771 Poznan, Polska) **Quantification of nonylic acid vanillyamide in Capsigel N and Neo-Capsiderm.** *Herba Polonica*, v. 36(3): p. 89-95, 1990 (Recd. 1992, 7 ref, Eng, Pol).

The proposed monograph of *Fructus and Tinctura capsici* for FPV foresees the spectrophotometric determination of capsaicin with 2,6-dichloroquinone-4-chlorimide after chromatographic separation. The parameters of method proposed for FPV were adopted for quantitative determination of nonylic acid vanillyamide in composite preparations capsigel N and Neo capsigel. It has been observed that synthetic capsaicin in analyzed preparations may be determined using the same method as in the case of *Fructus and Tinctura capsici*.

9204-2688 Farah, M.H., Andersson, R. , Samuelsson, G.* (Department of Pharmacognosy, University of Uppsala, Biomedical Center, Box 579, S-75123, Uppsala, Sweden) **Microdontin A and B: Two new aloin derivatives from Aloe microdonta.** *Planta Medica*, v. 58(1): p. 88-93, 1992 (5 ref, Eng).

The leaf juice of *Aloe microdonta* is used in Somali traditional medicine as a remedy for jaundice and for topical treatment of skin diseases. Mucilage was precipitated from the fresh juice by addition of ethanol and the supernatant chromatographed on Amberlite XAD-2 to yield a fraction containing anthraquinone derivatives. Flash chromatography on silica gel followed by preparative TLC yielded aloin A and a new compound. Spectral data (mass, 1H-and 13C-NMR) identified this compound as a mixture of aloin A and B where the glucose of both compounds is esterified with 4-hydroxycinnamic acid at the 6'-position. The two compounds were denoted as microdontin A and B, respectively.

9204-2689 Hagemann, K., Piek, K., Stockigt, J., Weiler, E.W.* (Lehrstuhl fur Pflanzenphysiologie, Fakultat Fur Biologie, Ruhr-Universitat Bochum, Postfach 102148 D(W)-4630 Bochum, Federal Republic of Germany) **Monoclonal antibody-based enzyme immunoassay for the quantitative determination of the tropane alkaloid, scopolamine.** *Planta Medica*, v. 58(1): p. 68-72, 1992 (39 ref, Eng).

A monoclonal antibody (SP1-4-A2) against scopolamine was produced, characterized, and used to develop a sensitive and selective, competitive enzyme immunoassay for the quantitation of the alkaloid found in members of the Solanaceae. As little as 10 pg of scopolamine can be quantitated in an unprocessed plant extract or in human serum after suitable dilution, corresponding to detection limits of scopolamine/ml of plant extract or 0.5 ng/ml of serum. The assay is more selective for scopolamine than previously reported immunoassays. The assay format was designed to minimize intra-and interplate variabilities which are, on an average, all below 3 percent. The assay reported here has been validated against an HPLC-based technique using plant samples.

9204-2690 Hazra, P., Kahol, A.P., Mondal, S.(Directorate of Cottage and Small Scale Industries, PO Drugachak, Haldia, Midnapore, West Bengal, India) **Improved process for production of citronellol from *Eucalyptus citriodora* oil.** *Research and Industry*, v. 37(2): p. 106-109, 1992 (6 ref, Eng).

Citronellal has been separated from *E. citriodora* oil by fractional distillation at reduced pressure. Process parameters for selective reduction of citronellal to citronellol with Raney nickel catalyst have been determined.

9204-2691 Kawashima, K., Mimaki, Y., Sashida, Y*.(Tokyo College of Pharmacy, 1432-1, Horinouchi, Hachioji, Tokyo 192-03, Japan) **Schubertosides A-D, new (22S)-hydroxycholestane glycosides from *Allium schubertii*.** *Chemical & Pharmaceutical Bulletin*, v. 39(10): p. 2761-2763, 1991 (9 ref, Eng).

Four new (22S)-hydroxycholestane glycosides, schubertosides A-D, have been isolated from the bulbs of *A. schubertii*. Their structures were determined by spectroscopic analysis and hydrolysis. The advanced Mosher's method was applied to determine the C-22 absolute configuration.

9204-2692 Khan, M.I., Saify, Z.S., Hashmi, R.Y.(Homoeopathic Research Laboratory, Department of Botany, University of Karachi, Karachi 75270, Pakistan) **Wheat coleoptile elongation test for bioassay of homoeopathic drugs.** *Pakistan Journal of Botany*, v. 23(1): p. 26-32, 1991 (12 ref, Eng).

A simple, quick and highly sensitive technique for the bioassay of homoeopathic drugs has been proposed. Young wheat coleoptile segments showed responses to the potency for centesimal dilutions of *Hypericum perforatum*, *Ignatia amara*, *Lemna minor*, *Nux vomica*, *Pulsatilla nigricans*, *Arnica montana*, *Acenitum napellus*, *Cimicifuga racemosa* and *Dioscorea villosa* within six hours of treatment.

9204-2693 Kingston, D.G.I., Gunatilaka, A.A.L. , Ivey, C.A. (Department of Chemistry, Virginia Polytechnic Institute and State University, Blacksburg, Virginia 24069-0212, USA) **Modified taxols, 7. A method for the separation of taxol and cephalomannine.** *Journal of Natural Products*, v. 55(2): p. 259-261 , 1992 (13 ref, Eng).

Taxol can be separated from the closely related co-occurring in *Taxus brevifolia* diterpenoid cephalomannine by oxidation of a mixture of the two with OsO₄ and flash chromatography of the resulting products.

9204-2694 Kockar, O.M., Kara, M., Kara, S. , Baser, K.H.C.(Faculty of Engineering and Architecture, Department of Chemical Engineering, Anadolu University,

Eskishir, Turkey) **Horse chestnut extraction and escin isolation.** *Chimica Acta Turcica*, v. 18(3): p. 345-351, 1990 (Recd. 1992, 9 ref, Eng).

The effect of extraction variables, such as, nature of solvent and its composition, temperature, average particle size, extraction time and solid/solvent ratio, on extraction of *Aesculus hippocastanum* seeds and isolation of its active principle escin were studied in laboratory, pilot plant and semi-industrial production scale extractors. The escin content of the seeds collected from Eskisir was found to be 5.0-5.5 percent and recovery of more than 99 percent pure escin was 2.2 percent based on dry seeds. It has been concluded that total dry extract and escin can be produced locally with comparable qualities and prices in the international market.

9204-2695 Lassak, E.V.(Phytochemical Services, P.O.Box 27 Berowra Heights, N.S.W. 2082 Australia) **The usefulness of water distillation curves in essential oil extraction practice.** *7th Asian Symposium on Med. Plants, Spices, and Other Natural Products (ASOMPS VII)*. Manila, 2-7 February 1992 (Eng).

The time required for complete essential oil extraction by means of water distillation varies not only with the plant species used but also with the type of plant material (wood, leaves, bark, etc) and its state of subdivision (whole or ground up). The most convenient way of monitoring the progress of the extraction is to plot the volume of oil recovered against water distillation time. The shape of the graphs can also be useful in obtaining some information on the chemical nature of the volatile oils. For example the distillation curves of monoterpenic oils differ significantly from those of largely sesquiterpenoid oils. (Abstr.No. WP-9).

9204-2696 Lee, H., Hong, W.H., Yoon, J.H. , Song, K.M., Kwak, S.S. , Liu, J.R.(Bioprocess Engineering Centre, KAIST, 373-1, Kusung-dong, Yusung-gu, Taejon, 305-701, Korea) **Extraction of indole alkaloids from *Catharanthus roseus* by using supercritical carbon dioxide.** *Biotechnology Techniques*, v. 6(2): p. 127-130, 1992 (6 ref, Eng).

The content of vindoline and cantharantine in the supercritical carbon dioxide extracts of leaves of *C. roseus* are determined by HPLC and identified by LC/MS. About 52 percent (w/w) of the initial vindoline content, 1.5 mg vindoline 1 g dry wt leaves, was recovered after extracting this material for 10h with carbon dioxide flow rate of 400ml/min at 40 degree C and 150 bar. Vindoline concentration in the extract was 67 percent (w/w). IARI, New Delhi.

9204-2697 Liu, K., Wang, J., Chen, H.(Biology Institute, Shandong Academy of Sciences, Jinan, China) **Separation by affinity chromatography and analysis of *Tradescantia paludosa* lectin.** *Acta Biochimica et Biophysica Sinica*, v. 23(5): p. 448-452, 1991 (7 ref, Chi, Eng).

A new lectin isolated from *T. paludosa* was purified by affinity chromatography on sepharose 4B. The lectin was found to agglutinate the erythrocytes of rabbit and white mouse as well as human A,B,O erythrocytes. Its activity was inhibited by D-galactose, N-acetylgalactosamine and D-fucose.

9204-2698 Moyler, D.A., Stephens, M.A.(Universal Flavors Ltd., Bilton Road, Bletchley MK1 1HP, United Kingdom) **Counter current deterpenation of cold pressed sweet orange peel oil.** *Perfumer & Flavorist*, v. 17(2): p. 37-38, 1992 (9 ref, Eng).

Washing process, distillation and washing, distillation (folding), preparative adsorption chromatography and counter current extraction currently being used for deterpenation of orange oil have been briefly discussed and counter current extraction has been discussed in more details.

9204-2699 Said, I.M.(Department of Chemistry, Universiti Kebangsaan, Malaysia) **Bioassays of some Malaysian medicinal plants.** *7th Asian Symposium on Med. Plants, Spices and Other Natural Prod.(ASOMPS VII). Manila*, 2-7 February 1992 (Eng).

Malaysia has a diverse flora in her tropical rain forests, some of which have been used in folk medicine. Screening of the extracts of some of these medicinal plants as an indication for further phytochemical work has been carried out. The bioassays conducted were brine shrimp lethality tests, anti-bacterial, and tests against SP-2 and Raji cells. More than twenty extracts were tested and potential plants were further scrutinised for detailed examination. (Abstr. No. WP-19A).

9204-2700 Sanagi, M.M., Ahmad, U.K., Smith, R.M.(Department of Chemistry, Universiti Teknologi Malaysia, 80990 Johor Bahru, Malaysia) **Application of supercritical fluid extraction and supercritical fluid chromatography to the analysis of *Curcuma longa* Linn..** *7th Asian Symposium on Med. Plants, Spices and Other Natural Prod.(ASOMPS VII). Manila*, 2-7 February 1992 (2 ref, Eng).

The application of supercritical fluid extraction (SFE) and supercritical fluid chromatography (SFC) to the analysis of turmeric (*Curcuma longa*) has been investigated. Using unmodified carbon dioxide as the extractant, the SFE has resulted with the removal of turmerones and other

volatile compounds from the sample whereas the use of methanol-modified carbon dioxide has enabled the extraction of the curcuminoids of which curcumin was the major component (90 percent recovery). On-line coupling of SFE with supercritical fluid chromatography (SFC) was carried out for the analysis of turmeric. The SFE-SFC was relatively fast, simple and fractionation of turmerones and curcuminoids was possible in a single run. The separation of curcuminoids by SFC was comparable to that by HPLC. This method can potentially be used for the analysis of analytes with highly volatile or aromatic components which are difficult to extract and/or trap. (Abstr. No. WO-26).

9204-2701 Sandberg, F.(Department of Pharmacognosy, Biomedical Center, P.O.Box 579, S-751 23 Uppsala, Sweden) **Pharmacological screening of potential medicinal plants.** *7th Asian Symposium on Med. Plants, Spices, and Other Natural Prod. (ASOMPS VII). Manila*, 2-7 February 1992 (Eng).

The methods for pharmacological screening of potential medical plants, recommended by UNIDO both *invivo* and *invitro*-methods were described. (Abstr. No. WO-8).

9204-2702 Schmeda-Hirschmann, G., Rojas de Arias, A.(Instituto de Investigaciones en Ciencias de la Salud (IICS), Rio de la Playa y La Gerenza, CP 2511, Paraguay) **A screening method for natural products on triatomine bugs.** *Phytotherapy Research*, v. 6(2): p. 68-73, 1992 (19 ref, Eng).

A simple method for screening natural products on triatomine bugs, vectors of Chagas' disease, was developed using fourth instar *Rhodnius neglectus* nymphs as an insect model. The statistical method of randomized blocks and randomized blocks with a dichotomous variable were compared and the minimum sample size for screening purposes was established. Tests were made on 94 plant extracts from 49 species, 28 of which are traditionally regarded as having some effect on arthropods or parasitic helminths. 50 *Microg* of crude hexane or ethanol extract was topically applied to each insect. The effect on mortality and moulting was assessed. Ten plant species caused an increased mortality compared with untreated controls. Moulting inhibition ranged from 22.2 percent to 33.3 percent and was related to insecticidal effect in most cases. Extracts from two *Meliaceae* plants belonging to the genera *Melia* and *Cabralea* were among the most active tested, causing 32.5 and 45 percent mortality, respectively. Extracts from a *Salvia* species killed 52.3 percent of the bugs. Ten of the 13 plants showing activity are used by the rural population in various parts of Latin America for arthropod control or as vermicifuges.

9204-2703 Segiet-Kujawa, E., Michalowska, A. (Institute of Medicinal Plants, Libelta 27,61-707 Poznan, Poland) **Determination of flavonoids in Hb. Origani. Herba Polonica**, v. 36(3): p. 79-82, 1990 (recd. 1992, 5 ref, Eng, Pol).

Densitometric and spectrophotometric methods of determination of flavonoids in *Origanum vulgare* have been described. Apigenin and luteolin have been identified in the methanolic extract of the drug. In densitometric method the fluorescence quenching of apigenin and luteolin on thin layer chromatographs have been measured. The spectrophotometric method was based on measurement of uv absorbance of sample with AlCl₃. Both the methods gave comparable results and can be used for routine analysis of Herba Origani. However, the spectrophotometric method allows to calculate only total flavonoid content.

9204-2704 Smoczkiewiczowa, A., Ostrowska, B., Jasiczak, J., Olszak, M., Rychlinska, H. (Zaklad Chemii Ogolnej i Analitycznej, Institut Towaroznawstwa Akademia Ekonomiczna, al. Niepodleglosci 146/150, 61-875 Poznan, Polska) **Method of estimation of diphenylamine as hypoglycaemic agent in onion (Allium cepa L.). Herba Polonica**, v. 36(3): p. 97-109, 1990 (Recd. 1992, 10 ref, Pol, Eng).

A new simple and rapid UV spectrophotometric method for the determination of diphenylamine in Polish and Arabic onions has been described. A correlation was observed between the diphenylamine content of the ether extracts and their hypoglycaemic activity.

9204-2705 Sturm, M.J. (Research Centre, Royal Perth Hospital, Perth, Australia) **The bioassay of platelet activating factor: Application and clinical role.** 7th Asian Symposium on Med. Plants, Spices, and Other Natural Prod. (ASOMPS VII). Manila, 2-7 February 1992 (Eng).

A sensitive bioassay for the quantitation of PAF in biological samples, which can also be used to compare the relative potency of PAF antagonists, has been described. The assay is based on the ability of platelets to release ¹⁴C-5-hydroxytryptamine (5HT) in a dose dependent manner. Briefly, labelled rabbit platelets are prepared by incubating platelet rich plasma with ¹⁴C-5HT. Following washing and isolation, platelets (5x10⁷) are incubated in the presence of imipramine (4.7 micro M) and indomethacin (1 microM), with synthetic PAF (0.1mL, 16-250 pg) or test sample in a total volume of 1.0ML for 10 min at 37 degree C. the reaction is terminated by rapid cooling and the released ¹⁴C-5HT, determined in the supernatant after centrifugation, is expressed as a percentage of the total cell associated isotope. PAF was measured in a variety of biological samples after appropriate extraction and purifica-

tion. Characterization of the platelet releasing activity of the samples as PAF was based on chromatographic behaviour and the ability of the PAF antagonist, WEB 2086, to block the releasing activity. In normal subjects, the level of PAF in blood was 2.10+0.25 (SEM) ng/mL (n=12), in platelets 0.91+0.11 ng/108 cells (n=7), and in stimulated neutrophils 12+1ng/106 cells (n=22). (Abstr.No.MO-17).

9204-2706 Tanabe, M., Yasuda, M., Adachi, Y., Ujita, K., Kano, Y. (Nagakura Pharmaceutical Company Ltd., 1-7-16 Shotenshita, Osaka 557, Japan) **HPLC analysis of gingerols and diterpenes in Japanese gingers.** *Shoyakugaku Zasshi*, v. 45(4): p. 316-320, 1991 (4 ref, Eng).

The quantities of three pungent compounds, 6-gingerol (6-G), 8-gingerol (8-G) and 10-gingerol (10-G), and two diterpenes, (E)-8beta, 17-epoxylabd-12-ene-15, 16-dial (I) and galanolactone (II) contained in fresh ginger *Zingiber officinale* were determined by HPLC. The seven varieties of gingers tested in this work, Kintoki, Yanaka, Sansyu, Otafuku, Tosaichi, Cambo and Jumbo, were cultivated under the same conditions in Kochi Prefecture, Japan. The small type gingers, Kintoki and Yanaka were found to contain much larger amounts of diterpenes I and II than the larger type gingers. As regards the pungent compounds (6,8 and 10-G), not much difference was observed between them, excepting for the middle type ginger, Sansyu.

9204-2707 Tanabe, M.*., Yasuda, M., Adachi, Y., Kano, Y. (Nagakura Pharmaceutical Company Ltd., 1-7-16 Shotenshita, Osaka 557, Japan) **Capillary GNC-MS analysis of volatile components in Japanese gingers.** *Shoyakugaku Zasshi*, v. 45(4): p. 321-326, 1991 (7 ref, Eng).

The amounts of monoterpenes and sesquiterpenes in Japanese fresh ginger *Zingiber officinale* were determined by using the capillary GC-MS selective ion-monitoring (SIM) system. The test solutions for GC-MS SIM were prepared by extracting samples with acetone. Seven varieties of gingers (small type gingers, Kintoki and Yanaka, middle type ginger, Sansyu and large type gingers, Otafuku, Tosaichi, Cambo and Jambo) were cultivated under the same conditions in Japan, and used for analysis. The results showed that there were considerable differences in the volatile component compositions of fresh gingers among the varieties tested.

9204-2708 Tholen, J.T., Truscott, R.J.W. (Biomolecular Chemistry Research Unit, University of Wollongong Northfields Avenue, Wollongong 2500, Australia) **Rapid glucosinolate analysis by HPLC.** 7th Asian Symposium on Med. Plants, Spices, and Other Natural Prod. (ASOMPS VII). Manila, 2-7 February 1992 (Eng).

As part of plant breeding program to reduce the total glucosinolate (GSL) content in rapeseed, an HPLC method has been developed enabling rapid quantitation of individual GSLs as their corresponding desulfated derivatives. The use of purified aryl sulfatase was found to be necessary because contaminant enzymes present in crude aryl sulfatase reduced GSL recovery during the desulfation step. Aryl sulfatase purified in a single step using gel permeation was found to give reproducible GSL recoveries. (Abstr. No. WP-29).

9204-2709 Truscott, R.J.W., Tholen, J.T., Buzzo, G., McGregor, I. (Department of Chemistry, University of Wollongong, PO Box 1144, Northfields Avenue, Wollongong, NSW, Australia 2500) **Measurement of glucosinolates in seed using the trubluglu meter.** 7th Asian Symposium on Med. Plants, Spices and Other Natural Prod. (ASOMPS VII). Manila, 2-7 February 1992 (Eng).

A simple and inexpensive method for the estimation of total glucosinolate (GSL) (toxic principle of *Brassica* species content in rapeseed is described which employs a newly developed portable reflectance instrument, the Trubluglu meter. The assay is based on the selective hydrolysis of GSLs by endogenous myrosinase at pH 9 followed by measurement of the released glucose using Clinistix strips. The meter, which is calibrated prior to use with a standard glucose solution, can display a digital readout in units of either mM glucose or micromol GSL/g seed. (Abstr. No. WP-30).

9204-2710 Yadava, R.N., Saini, V.K. (Department of Chemistry, Dr HS Gour Vishwavidyalaya, Sagar 470003) **Spectrophotometric estimation of naturally occurring volatile constituents of antimicrobial oils.** Journal of Indian Chemical Society, v. 68(9): p. 532-533, 1991 (8 ref, Eng).

Essential oils from leaves of *Majorana hortensis*, *Eupatorium triplinerve* yielded alpha-terpineol, eugenol, citral, 1,8 cineole, limonene and using colouring reaction and spectrophotometric method of determination of these oils has been described.

9204-2711 Zhang, J.S., Tian, Z.X., Lou, Z.C. (School of Pharmacy, Beijing Medical University, Beijing 100083, China) **Simultaneous determination of five bitter secoiridoid glycosides in nine Chinese Gentiana species used as the Chinese drug "Long Dan" by high performance liquid chromatography.** Acta Pharmaceutica Sinica, v. 26(11): p. 864-870, 1991 (8 ref, Chi, Eng).

A new and rapid analytical method for the simultaneous determination of five bitter secoiridoid glycosides in the Chinese drug "Long Dan", roots of *Gentiana man-*

shurica and 8 allied species by HPLC has been developed. The bitter secoiridoid glycosides eluted were detected at a wavelength of 254 nm and the analysis was successfully carried out within 23 minutes. This method is sensitive, rapid, accurate and has good reproducibility. Recoveries of each secoiridoid glycoside were 100.0 to 101.5 percent with coefficients of variation 0 to 2.5 percent (n=3). The contents of five bitter secoiridoid glycosides in the roots of *G.manshurica* and eight allied species indigenous to China were determined and reported.

Miscellaneous

9204-2712 . **Lettuce opium- a monograph.** Lawrence Review of Natural Products, 2 pp., November 1991 (13 ref, Eng).

Lettuce opium (*Lactuca virosa* and *L.sativa* var. *capitata*) is an antiquated folk remedy which finds little value in modern medicine. The hallucinogenic effect of lettuce opium and other lettuce derivatives has not been substantiated. Common names, botany, history, chemistry, pharmacology and toxicology of lettuce opium have been briefly discussed.

9204-2713 . **Castor- a monograph.** Lawrence Review of Natural Products, pp. 2, October 1992 (16 ref, Eng).

Botany, history, chemistry, pharmacology and toxicology of *Ricinus communis* and *R.sanguineus* have been briefly reviewed.

9204-2714 . **Rosemary- a monograph.** Lawrence Review of Natural Products, pp. 2, February 1992 (8 ref, Eng).

Rosmarinus officinalis is a popular herb that finds wide use in cooking and in cosmetics. Although several of the components of the plant have been shown to possess pharmacologic activity, there is no indication that ingestion of the plant or oil is of therapeutic benefit. Botany, history, chemistry, pharmacology and toxicology of rosemary have been briefly reviewed.

9204-2715 . **Mustard- a monograph.** Lawrence Review of Natural Products, pp. 2, February 1992 (5 ref, Eng).

The mustards *Brassica juncea*, *B.nigra*, *B.alba* and *Sinapis juncea* have been used in traditional medicine, primarily as counter irritants and continue to find some use in a poultice. The oil is highly irritating. Botany, history, chemistry, pharmacology and toxicology of brassica have been briefly reviewed.

9204-2716 . **Chickweed- a monograph.** Lawrence Review of Natural Products, pp. 1, February 1992 (6 ref, Eng).

Although chickweed is ubiquitous and has been used in traditional medicine for centuries, there is no evidence that it offers any significant therapeutic activity. It is generally well tolerated, although the ingestions of large amounts of the plant may be associated with nitrate toxicity. Botany, history, chemistry, pharmacology and toxicology of *Stellaria media* (chickweed) have been briefly reviewed.

9204-2717 . Karaya gum- a monograph. *Lawrence Review of Natural Products*, pp. 2, March 1992 (11 ref, Eng).

Karaya gum obtained from *Sterculia urens*, *S.villosa*, *S.tragacantha* and other *Sterculia* species finds wide spread use in the food and pharmaceutical industries. The gum has not been associated with any significant toxicity and is essentially inert when ingested. Botany, history, chemistry, pharmacology and toxicology of karaya gum have been briefly reviewed.

9204-2718 . Savory- a monograph. *Lawrence Review of Natural Products*, pp. 1, March 1992 (5 ref, Eng).

Summer and winter savory have been used for centuries as condiments. Their use in traditional medicine centres primarily on the antispasmodic and antibacterial effects of the volatile oil. Savory is not associated with significant toxicity and should be investigated for its antiuretic activity. Botany, history, chemistry, pharmacology and toxicology of *Satureja hortensis* and *S.montana* have been briefly discussed.

9204-2719 Anonis, D.P.(Consulting Chemist Perfumer, 98-41 64th Road, Pego Park NY 11374, USA). **Magnolia in perfumery.** *Perfumer & Flavorist*, v. 17(2): p. 27-29, 1992 (11 ref, Eng).

Botanical origin *M.macrophylla*, *M.grandiflora* of the plant, mode of production of magnolia flower oil, chemical composition, synthetic compounds and application of magnolia perfumes have been briefly discussed. Five formulas for making magnolia flower perfume have been described.

9204-2720 Broderick, J.J.(189 Woodland Avenue, River Edge, NJ 07661-2322, USA) **Reflections of a retired flavorist before he forgets: Cocoa.** *Perfumer & Flavorist*, v. 17(2): p. 31, 1992 (Eng).

History of the development of cocoa flavour has been briefly discussed.

9204-2721 Chelladurai, A.S.S.(Bodinayakanur 626513, Madurai, TN, India) **Spices in homoeopathy medicines.** *Indian Spices*, v. 28(4): p. 5-6, 1991 (Eng).

Use of garlic, celery asafoetida, chilli, cinnamon, saffron, pomegranate, clove, nutmeg, basil, poppy, parsley, pepper, mustard, staranise and ginger in homeopathy has been reported.

9204-2722 Chu, E.P., Figueiredo-Ribeiro, R.C.L.(Instituto de Botanica de Sao Paulo, Caixa Postal 4005, CEP 01051, Sao Paulo, SP, Brazil) **Native and exotic species of *Dioscorea* used as food in Brazil.** *Economic Botany*, v. 45(4): p. 467-479, 1991 (91 ref, Eng).

The major reserve compounds of tubers of *Dioscorea* species (starch, soluble carbohydrates proteins and non-soluble fibres of Brazil are analyzed with a view to their economic importance for staple food and pharmaceutical industry. Twenty native and the cultivated edible exotic species are listed.

9204-2723 Dudeja, M., Singh, J.P., Sangwan, N.K., Dhindsa, K.S. (Department of Chemistry and Biochemistry, Haryana Agricultural University, Hisar 125004, India) **Synthesis and characterization of V(IV), Fe(II), Co(II), Ni(II) and Cu(II) complexes of some cinchona alkaloids.** *Chimica Acta Turcica*, v. 18(3): p. 359-364, 1990 (Recd. 1992, 14 ref, Eng).

Complexes of cinchonine, cinchonidine and quinine with the title ions have been prepared and their structures elucidated. These complexes of drug molecules with metal ions improve their biological activity.

9204-2724 El-Gammal, S.Y.(P.O.Box No. 138 Maddi Cario, Egypt) **Henna and psoriasis.** *Bulletin of Indian Institute of History of Medicine*, v. 21(2): p. 125-132, 1991 (12 ref, Eng).

Henna *Lawsonia inermis* was known to man since time immemorial. The parts mostly used were the leaves and flowers for medicinal and cosmetic preparations while branches and roots were used in domestic purposes. Henna was used by the ancient Egyptians to dye their palm and feet prior to the wedding night. They also found that many skin infections were treated and cured successfully with henna. Clinical trials have been made with strained solution of henna leaves decoction painted on affected areas in various concentrations with encouraging results on a group of psoriasis patients. NSL, New Delhi.

9204-2725 Estrada, B.R., Madulid, R.S.(Research Center for Natural Science, University of Santo Tomas, Philippines) **Alkaloid field survey in Palawan, Philippines.** *7th Asian Symposium on Med. Plants, Spices and Other Natural Prod.(ASOMPS VII)*. Manila, 2-7 February 1992 (3 ref, Eng).

A field survey for alkaloid-bearing plants was conducted in representative areas of Palawan as a continuation of a series of surveys done in the Philippines. In three separate trips scoring the whole Palawan island, a total of 479 plants belonging to 74 families were screened in the field using the Culvenor-Fitzgerald method. Thirty species were found to be positive to Mayer's reagent representing 6.3 percent of the total specimens collected. (Abstr. No. WP-6).

9204-2726 Handa, S.S., Chawla, A.S., Sharma, A.K. (Department of Pharmaceutical Sciences, Panjab University, Chandigarh 160014, India) **Plants with antiinflammatory activity.** *Fitoterapia*, v. 63(1): p. 3-31, 1992 (278 ref, Eng).

Plant species of ninety-six genera belonging to fifty-six families reported to have antiinflammatory activity have been reviewed and the active principles wherever identified for the alleged biological activity have been incorporated.

9204-2727 John, K. (Spices Board, PO Box 1909, Ernakulam, Kochi 682018, Kerala, India) **The gallery of spices and herbs-IV..** *Indian Spices*, v. 28(1): p. 26-29, 1991 (Eng).

Origin and distribution, description of plants, flavour characteristics, usage profiles and Indian production of *Myristica fragrans*, *Allium cepa* and *Origanum vulgare* have been reported.

9204-2728 John, K. (Spices Board, PO Box 1909, Ernakulam, Cochin 682018, Kerala, India) **The gallery of spices and herbs-VII..** *Indian Spices*, v. 28(4): p. 18, 1991 (Eng).

Origin and distribution, description, flavour characteristics, usage profiles and Indian production of sesame, staranise, tarragon, thyme, turmeric and vanilla have been reported.

9204-2729 Kuzuya, M., Sakata, H., Kondo, S.I., Noguchi, A. (Gifu Pharmaceutical University, 5-6-1, Mitachorai-Higashi, Gifu 502, Japan) **Mechanochemical solid state reactions of natural products for medicinal use containing hydroxyanthraquinone derivatives.** *Yakugaku Zasshi*, v. 111(11): p. 665-671, 1991 (26 ref, Eng, Jap).

In commercial powdered natural products for medicinal use containing various combined forms of hydroxyanthraquinone derivatives such as Sennae Folium, Cassiae Semen, Rhei Rhizoma and Aloe a considerable amount of stable free radicals was found to be present by using electron spin resonance (ESR) spectral measurements. It was also found that the vibratory milling of such powders in a metallic vessel enhanced the ESR spectral

intensities, demonstrating the occurrence of mechano-radical formation. Separate experiments also demonstrated that the vibratory milling of various kinds of powdered hydroxyanthraquinone derivatives mixed with calcium oxalate has produced the mechanoradicals effectively, but they decayed gradually on standing at room temperature. It was suggested, therefore, that the mechanoradicals formed in the above natural products are metal complexes of the corresponding semiquinone anion radicals induced by solid state one electron transfer mechanism from the active metal surface, part of which is further immobilized in polymeric fibers or the like in the plant tissues.

9204-2730 Martin, P.J. (Cashew Research Project, PO Box 608, Mtawara, Tanzania) **The Zanzibar clove industry.** *Economic Botany*, v. 45(4): p. 450-459, 1991 (38 ref, Eng).

For about 150 years cloves (*Syzygium aromaticum*) have been a major export crop of Zanzibar. The industry was established through large plantations but these have been progressively fragmented into smaller holdings. Throughout this century the industry at home has faced several recurring problems, the worst of which are tree diseases, ageing tree populations and occasional neglect of trees. As a result, replanting has been crucial to the maintenance of the industry which has also been strengthened by government assistance. Overseas, Zanzibar faced little competition in the world clove market until recently and this is now being aggravated by increasing self-sufficiency in Indonesia. The future of the Zanzibar industry will depend on its ability to cope with the problems of the industry at home and on its success at selling cloves in an increasingly competitive world market.

9204-2731 Morton, J.F. (Morton Collectanea, University of Miami Coral Gables, FL 33124, USA) **Country borage (*Coleus amboinicus* Lour.), a potent flavoring and medicinal plant.** *Journal of Herbs, Spices & Medicinal Plants*, v. 1(1&2): p. 55-56, 1992 (56 ref, Eng).

A.amboinicus, believed to be native to the Moluccas, was introduced into many areas of the old world tropics and some of the Pacific islands. Because of its aromatic leaves, it is often used as a substitute for borage or thyme. In this paper its origin, distribution, medicinal uses and phytochemical work are reviewed.

9204-2732 Mosciano, G., Fasano, M., Michalski, J., Sadural, S. (Bush Boake Allen, 7 Mercedes Drive, Montvale, NJ 07645, USA) **Organoleptic characteristics of flavor materials.** *Perfumer & Flavorist*, v. 17(2): p. 33-35, 1992 (Eng).

Source, FEMA no, CAS Registry no, synonyms, occurrence, odour characteristics, taste characteristics and

suggested applications of 20 chemical products including blackcurrant essence 160 fold, cinchona bark red, cocoa distillate, coffee espresso, mimosa absolute, molasses blackstrap and valencia orange juice oil have been described.

9204-2733 Nelia, P., Cortes-Maramba, M.D.(National Integrated Research Programme on Medicinal Plants, Philippines) **Philippine programme on herbal medicine.** *7th Asian Symposium on Med. Plants, Spices and Other Natural Prod. (ASOMPS VII). Manila, 2-7 February 1992 (Eng).*

In 1974, a multi-sectoral group of researchers on medicinal plants formed the National Integrated Research Programme on Medicinal Plants (NIRPROMP). The research activities were divided into two Missions. Mission I has the general objective of propagating the use by the people, of herbal medicine of proven therapeutic efficacy and safety. The main objective of Mission II is to study medicinal plants in depth through phytochemistry and pharmacotherapy studies. The results of the two missions were discussed. (Abstr. No. MO-4).

9204-2734 Pandit, B.R.(Department of Life Sciences Bhavnagar University, Bhavnagar-364002, India) **Conservation of over exploited medicinal plants of Gujarat, India.** *7th Asian Symposium on Med. Plants, Spices, and Other Natural Prod. (ASOMPS VII). Manila, 2-7 February 1992 (Eng).*

There has been a substantial depletion of natural resources specially of medicinal plants due to fast development eg. *Asparagus racemosus*, *Withania somnifera* and *Glycyrrhiza glabra* have been particularly affected. Conservation of these vulnerable plants through in-situ conservation (biosphere reserve and gene sanctuary) and ex-situ (living herbarium-garden, seed bank, tissue culture and germ-plasm bank) in Gujarat have been discussed.

9204-2735 Rastogi, D., Kumar, D.(College of Forestry, Dr Y.S.Parmar University of Horticulture and Forestry, Nauni, Solan 173230, HP, India) **Commercially used steroid yielding plants of India.** *Indian Drugs, v. 29(6): p. 269-270, 1992 (4 ref, Eng).*

Discorea spp., *Solanum spp.*, *Agave spp.*, *Costus speciosus* and *Trigonella foenum-graecum* have been reported as the commercial plant sources of steroid precursors.

9204-2736 Reyes, G.D., Raymundo, A.K., De Padua, L.S.(National Institutes of Biotechnology and Applied Microbiology, University of the Philippines at Los Banos College, Laguna, Philippines) **Microbiological evaluation**

of selected herbal drugs. *7th Asian Symposium on Med. Plants, Spices, and Other Natural Prod. (ASOMPS VII). Manila, v. 2-7 February 1992 (Eng).*

Ten selected herbal drugs intended for internal use in humans were evaluated for safety to consumers. Evaluation included determination of microbial contamination and identification of contaminant microorganisms and determination of antimicrobial activity using a microbiological assay method. Results revealed that six of the 10 herbal drugs, all locally processed, were contaminated with bacteria. No imported sample was contaminated, however. Samples packed in ordinary plastic bags carried higher number of contaminants than those packed in bottles. Contamination, however, was not correlated with either pH or moisture content of the herbal drugs. Nevertheless, all the herbal drugs evaluated exhibited antimicrobial activity against seven of the eight representative test organisms and were generally effective against both Gram-positive and Gram-negative bacteria but not against molds. (Abstr. No. MO-16).

9204-2737 Sharma, K., Dandiya, P.C.(Department of Pharmacology, SMS Medical College, Jaipur 302004, Rajasthan, India) **Withania somnifera** Dunal-present status. *Indian Drugs, v. 29(6): p. 247-253, 1992 (55 ref, Eng).*

Pharmacognostical characters, chemical constituents and extensive pharmacological activities viz., antistress, antibiotic, antitumor, antiinflammatory, CNS and anticonvulsant activities of *W.somnifera* have been presented in the review.

9204-2738 Stone, B.(Department of Botany, BP Bishop Museum Honolulu and Philippine Plant Inventory Project, National Museum, Manila, Philippines) **Rutaceae of the Philippines: Systematic biogeographic and biological aspects.** *7th Asian Symposium on Med. Plants, Spices and Other Natural Prod. (ASOMPS VII). Manila, 2-7 February 1992 (Eng).*

In the course of preparing a new treatment for the new flora of the Philippines, a preliminary version of the Rutaceae shows a number of changes in taxonomy, nomenclature, and thus to some extent in our biogeographic knowledge as well. A consideration of these changes, is presented to help bring our knowledge of Philippine Rutaceae up to date, and also to exemplify the sort and perhaps the extent of changes which may be expected as other families are revised. (Abstr. No. WB-3).

9204-2739 Swayam Prakasa, M.K.(SV Ayurvedic College Tripati 617601 AP, India) **Treatment of anaemia with spectral reference to iron in ancient Indian medicine**

Ayurveda: A historical perspective. *Bulletin of Indian Institute of History of Medicine*, v. 21(2): p. 99-103, 1991 (9 ref, Eng).

Two main texts of Ayurveda viz., Charaka Samhita and Sushruta Samhita, which were said to be written around 1500 BC mentioned the use of iron. Iron powder processed along with herbs like Amalaki (*Emblica officinalis*), a rich source of ascorbic acid is indicated in pandu (Anaemia). Vaghata, a 4th century AD author of Ashlangahridaya considered iron as the best among drugs used for anaemia. Use of iron in modern medicine for anaemia dates back 18th-19th centuries. Turmeric is other important drug indicated. NSL, New Delhi.

9204-2740 Ualat, C.R., Romero, F.B., Diaz, H.R., Pascua, E.M., Layugan, M., Pascua, O.J. (Department of Chemistry, College of Arts and Sciences, Isabela State University, Echague, Isabela, Philippines) **Alkaloid field survey of plants in northern Luzon, Philippines.** *7th Asian Symposium on Med. Plants, Spices and Other Natural Prod. (ASOMPS VII)*. Manila, 2-7 February 1992 (1 ref, Eng).

A field testing was conducted in selected areas of Northern Luzon. The alkaloid screening was conducted following the procedures described by Culvenor and Fitzgerald. A total of one hundred forty plant species were screened. Eighteen species were found to be positive, for the presence of alkaloids. (Abstr. No. MP-1).

9204-2741 Verghese, J., Jacob, C.V., Balakrishnan, K.V., Kurian, T. (Synthite Industrial Chemicals Ltd., Synthite Valley, Kolenchery 682311, Kerala, India) **Spotlight on mustard.** *Indian Spices*, v. 28(4): p. 12-17, 1991 (56 ref, Eng).

Fixed and seed meal, pungent principles and essential oil of mustard (*Brassica* spp. have been discussed.

9204-2742 Xiao, P.G. (Institute of Medicinal Plant Development (IMPLAD) Chinese Academy of Medicinal Sciences, WHO Collaborating Centre for Traditional Medicine, Beijing 100094, China) **Product development of medicinal plants, spices and other natural products in China.** *7th Asian Symposium on Med. Plants, Spices and Other Natural Prod. (ASOMPS VII)*. Manila, 2-7 February 1992 (Eng).

A nationwide survey in China has shown that there are 7,295 species of plants used medicinally, and about 400 species used as aromatic plant resources. They have paved a good basis for further product development. Medicinal plants have been integrated with food (as additives), beverages cosmetics natural insecticides etc. e.g. hyperzine A, anisodamine and anisodine, *Cordyceps*, *Hippophae rhamnoides* and *Rubus suavissimus* are representatives on

recent achievements of product development in China. (Abstr. No. H-2).

New Publications

9204-2743 Cracker, L (Editor) (Department of Plant & Soil Sciences, University of Massachusetts, Amherst, MA, USA) **Journal of Herbs, Spices & Medicinal Plants.** V.1(1&2), 1992; ISSN: 1111-2222 Food Products Press, 10 Alice Street, Binghampton, NY 13904-1580, USA (Subscription: Individuals US\$24, Institutions US\$32, Libraries US\$42). (Eng).

As consequence of global interest in the use of herbal medicine, herbal cosmetics, and health foods, research efforts have increased tremendously in this area. In view of this, publication of a new scientific journal, which will report original research papers in the area of medicinal and aromatic plants is a welcome step. This quarterly journal will publish research papers related to the botany, chemistry, horticulture, and pharmacology of herbs, spices, and medicinal plants. Besides original research papers, review articles, short notes, book reviews and calendar of forthcoming conferences will also be included. The inaugural issue of the journal contains 6 original research communications, one short note and three review articles. The journal has an international editorial board. The articles in the journal are indexed and abstracted in a number of abstracting services such as Medicinal & Aromatic Plants Abstracts (MAPA), CAB Abstracts, FSTA and C.A.B.S Abstracts.

9204-2744 Mahindru, S.N. (Metropolitan Book Co. Pvt. Ltd., Netaji Subash Marg, New Delhi, India) **Indian Plant Perfumes** (xiv+263, 1992, Rs. 350.00, US \$20.00). (Eng).

The book discusses various aspects of Indian perfumery plants in eight chapters: Introduction, essential oils, Indian perfumery products, odour appreciation, natural essential oils- the present scenario, analysis of essential oils, list of Indian perfumery plants and Indian plant perfumes. A bibliography and subject index have also been provided. Out of more than 300 plants listed in the book more than 100 have been described in detail. Extraction of essential oils, their chemistry and uses have been discussed.

9204-2745 Sun, H.D. (Kunming Institute of Botany, Academia Sinica, Kunming, 650204, China) **Some new drugs and bioactive compounds from Medicinal plants of Southwest China.** *7th Asian Symposium on Med. Plants, Spices and Other Natural Prod. (ASOMPS VII)*. Manila, 2-7 February 1992 (Eng).

Southwest China, especially Yunnan is well known for its abundant plant resources. Owing to its complex topography and variety of climate type including frigid,

temperate and tropical zones, Yunnan province is favorable for the growth and developments of various kinds of plants and is very rich in medicinal plant resources. There are more than 15000 species of seed plants in Yunnan accounting for nearly half of the country's total. Hence the province is renowned as the "Kingdom of plants". It has 350 species of Chinese traditional drugs, 400 species of national minority drugs and 4000 species of folk drugs. Research conducted on medicinal plants and some new drugs developed by the Laboratory of phytochemistry, Kunming Institute of Botany, Academia Sinica, has been reviewed. The laboratory has published 500 papers on medicinal plants and isolated over 1000 natural compounds, of which about 50 compounds have shown strong biological activity.

Abstr No. MO-14.

Patents

9204-2746 Attila, L.A.D.(Helme Tobacco Company) Nicotine removal from tobacco, US. US 4,848,373 (Cl. 131-297; A24 B15/24), 1989, 8PP. (Eng).

The patent discloses the details of the process for removing nicotine from tobacco, without affecting flavour and aroma of the final product tobacco. The process consists of mixing tobacco, having a moisture content of 25-53 percent with an alkalisng agent so as to obtain pH range of 8-11. A uniform pressure of 1 atm. for 4-14 week has been maintained in an aerobic environment at 40degree-120degree C. Fermented tobacco was dried to 39 percent moisture, treated with 4 percent Na₂CO₃ H₂O and cold sweated at 60-90degree C for 10 weeks.

9204-2747 Erich(Herbe Wirkstoffe G.m.b.H, Germany) Extracts rich in beta-aescin from horse chest nut, Eur.Pat.Appl. EP 298,148 (Cl. C07 H15/256), 1989, 5PP. (Eng).

Deep-frozen horse chestnut seeds are thawed and extracted thoroughly with water to obtain an extracts which is rich in beta-aescin..

9204-2748 Karl, R., Gerhard, S.(Mucos Pharma G.m.b.H. und Company, Germany) Use of catabolic enzymes in the treatments of AIDS and its early stages (LAS,ARC) EUR.PAT.APPL.EP. 309,602 (Cl. A61 K37/54), 1989, 7PP. (Eng).

Catabolic enzymes hydrolases, proteases are used for the treatment of AIDS and pre-AIDS. Thus, patients testing positive for HIV and showing the symptoms of AIDS, AIDS-related complex or lymphadenopathy syndrome were treated with injections containing trypsin, chymotrypsin, papain, and Wobenzym pills containing trypsin, chymotrypsin, papain, lipase, amylase, and rutin along with

various regimens of Wobe-Mugos tablets and suppositories for nearly 23 months. The patients showed an improvement in T4/T8 cell ratio and general clinical conditions.

9204-2749 Leon, J., Edward, S.(Akademia Medyczna Lublin) Method of separation of mixture of alkaloids from raw materials, Pol. PL 131,874 (Cl. A61 K31/33), 1986, 2PP. (Pol, Eng).

Alkaloids are obtained from plant materials by extraction with 0.1-57 acetate buffer. The buffer used can be prepared from HOAc and NaOAC. Re-extraction of the acetate buffer extract with CHCl₃, followed by additions of the buffer to aqueous phase. Recycling of the aqueous phase to the first step extraction process yield alkaloid. In this way, mixture of alkaloids from Boldo leaves, upto the tune of 87-91 percent can be isolated.

9204-2750 Ryohei, T., Makoto, O., Mitsutoshi, H., Danji, F. (Kikkoman Corporation, Japan) Procyanidins from bark preparations of drugs and antioxidants for food and cosmetics, Japan Kokai Tokkyo JP 01,42,479 (Cl. 07 D311/62), 1989, 3PP. (Jap, Eng).

Procyanidins (R1=H, Caproyl, glucopyranosyl; R1=H, OH, in the given structural formula), which are useful in the preparation of drugs and also used as an antioxidants for food and cosmetics. Procyanidins are extracted from the inner bark of Cypress plant. The process involves the removal of outer bark from the plant, and the inner bark was collected, frozen and made into granules. The granules are mixed with water at 20degree C-140degree C, filtered, and the filtrate was washed with ether to give anthocyanidins. Maximum yield of the compound can be obtained when the extraction was carried out between the temperature of 70degree C-100degree C.

9204-2751 Ryszard, H., Meria, S., Kazimierz, Z., Zdzislaw, M. (Instytut Chemii Przemyslowej, Poland) Process for separation of complex lanatosides A,B, and C from water solutions, POL.PL 138,021 (Cl. C07J19/00), 1987, 3PP. (Eng, Pol).

Lanatosides can be obtained by extracting *Digitalis lanata* with water or aqueous-organic solvents, and by passing aqueous solution through a series of column. Containing 2000 cms³ of Diaion HP20 resin each. After elution of the column with 50 percent and 90 percent aqueous acetone yielded lanatoside. Further, lanatoside containing fraction yielded an aqueous solution which when extracted with 9 percent mixture of CHCl₃ and BuOH, and distilled under reduced pressure to remove BuOH. The aqueous residue is collected and treated with ACOEt to ppt. a mixture of lanatosides A,B and C. Purification of this material yielded

52mg lanatosides C (65 percent of the amount contained in the starting aqueous extract).

9204-2752 Shizuo, T., Yukinobu, I., Heihachiro, T., Hiroshi, M. (Tsumura and Company, Japan) **Pharmaceuticals containing gomisin N as an antioxidant, Japan Kokai Tokkyo Koho JP 01,16,721 (Cl. A61 K31.36), 1989, 5PP.** (Jap, Eng).

Gomisin N from *Schisandra fructus* is used as an antioxidant in pharmaceuticals. The compound protects hardening of the arteries and in turn lipid oxidation. Tablets are usually a mixture of corn starch, crystalline cellulose, and gomisin N along with other ingredients. Detailed method of extraction of gomisin N and the antioxidant activity of the compound has been described.

9204-2753 Toshiaki, M., Akira, K. (Japan Tobacco Incorporation) **glucopyranosyl fructofuranoside derivatives as neoplasm inhibitors, Japan kokai Tokkyo Koho, JP 01,47,795 (Cl. C07 H13/06), 1989, 6 PP.** (Eng, Jap).

Fructofuranosides (R1,R2 and R3=C3-8 branched or linear acyl; R4=H or acetyl in the given structural formula) are neoplasm inhibitors. The compound fructofuranosides derivatives are extracted from *Nicotiana glutinosa* and its antitumor activities against Sarcoma-180 in mice has been demonstrated.

9204-2754 Toshiaki, M., Akira, K., Hitoshi, O. (Japan Tobacco Incorporation, Japan) **Inhibitors of aldose reductase extracted from plants for treatment of diseases associated with diabetes, JAP.KOKAI TOKKYO KOHO, JP 01,26,589 (Cl. C07 H13/04) 1989, 6PP.** (Eng, Jap).

Sucrose fatty acid esters (R1,R2,R3=C3-8 branched or linear acyl; R4=acetyl or OH in the given structural formula) are reported to be aldose reductase inhibitors. They are useful in the treatment of diseases associated with

diabetes, also vascular diseases, nervous diseases and diseases associated with renal failure. The compound was extracted from the leaves of *Nicotiana glutinosa*. Sucrose fatty acids compounds may be administered to patients at the dose level of 1-100mg/kg/day either orally, S.C or i.v. The inhibiting activities of aldose reductase were demonstrated. Also, acute toxicity studies on mice were given.

9204-2755 Yoshiaki, N., Munehiro, T., Naoiki, I. (Daiichi Seiyaku Company Limited) **Pantetheine and soy sterols as anti cholesteremics, Japan Kokai Tokkyo Koho JP 01,79,119 (Cl. A61 K31/56), 1989, 6pp.** (Jap, Eng).

Pantetheine and soy sterols are used as anticholesteremics and are very effective in preventing arteriosclerosis. Soysterols and pantetheine were added to a diet containing 0.5 percent of cholesterol and fed to rabbits. The animals were sacrificed and the cholesterol level in the blood serum was measured. It was found that the serum cholesterol level has been significantly lowered.

9204-2756 Yujiro, S., Ritsu, Y., Toshihiro, N., Yorihide, K., Kajiro, N., Hiroshi, I. (Ohta's Issan Company Limited, Japan) **Pharmaceuticals containing flavonoids, saponins and glycosides, there of for treatment of liver disorders, Japan Kokai Tokkyo Koho, JP 01,66,120, (Cl. A61 K31/35), 1989, 7PP.** (Jap, Eng).

Pharmaceuticals are composed of flavonoids, (R1-R6=H, OH, OMe, glucose residue, O-glucose, O-glucose-xylose in a given structural formula). Saponins and their glycosides. Isoflavonoids are isolated from roots of *Pueraria lobata* and also from flowers of the plant. From this triterpenoidal saponins are separated. The purified isoflavonoids at the dose level of 250 mg/kg showed 50.7 percent inhibition of GOT activity in CCl₄-induced liver toxicity in mice. Isoflavonoids also, exhibited 73.0 inhibition of GPT activity at the dose level of 250 mg/kg in high fat induced liver disorder in mice.

List of Serials Abstracted
Volume 14(4), 1992

1. 7th Asian Symposium of Med. Plants, Spices and Other Natural Prod. (ASOMPS VII). Manila, Philippines, 2-7 February 1992
2. *Acta Biochimica et Biophysica Sinica*, 1991, 23(5)
3. *Acta Pharmaceutica Jugoslavica*, 1991, 41(3)
4. *Acta Pharmaceutica Nordica*, 1992, 4(1)
5. *Acta Pharmaceutica Sinica*, 1991, 26(9,11)
6. *Agricultural and Biological Chemistry*, 1991, 55(9)
7. *Australian Veterinary Journal*, 1992, 69(1)
8. *Biochemistry and Cell Biology*, 1991, 69(10&11)
9. *Biologia Platarum (Prague)*, 1989, 31(4)
10. *Biotechnology Techniques*, 1992, 6(2)
11. *Bulletin of Indian Institute of History of Medicine*, 1991, 21(2)
12. *Canadian Journal of Botany*, 1991, 69(2,8,9)
13. *Canadian Journal of Plant Science*, 1991, 71(3)
14. *Ceskoslovenska Farmacie*, 1991, 40(4-5)
15. *Chemical & Pharmaceutical Bulletin*, 1991, 39(10,11,12)
16. *Chemico-Biological Interactions*, 1991, 80(1,2)
17. *Chemistry Letters*, 1990, No.9,10
18. *Chimica Acta Turcica*, 1990, 18(3)
19. *Chinese Medical Journal*, 1991, 104(9)
20. *Chinese Science Bulletin*, 1991, 36(20,23)
21. *Contact Dermatitis*, 1992, 26(1,2)
22. *Economic Botany*, 1991, 45(4)
23. *Ethnobotany*, 1991, 3(1&2)
24. *Fitoterapia*, 1992, 63(1)
25. *Geobios*, 1992, 19(1)
26. *Herba Polonica*, 1990, 36(3)
27. *Heterocycles*, 1992, 32(3)
28. *Himalayan Journal of Environment and Zoology*, 1991, 5(2)
29. *Indian Biologist*, 1991, 23(1)
30. *Indian Drugs*, 1992, 29(6)
31. *Indian Journal of Agricultural Sciences*, 1992, 62(5)
32. *Indian Journal of Clinical Biochemistry*, 1992, 7(1)
33. *Indian Journal of Entomology*, 1990, 52(1)
34. *Indian Journal of Indigenous Medicines*, 1991, 8(1)
35. *Indian Medical Gazette*, 1992, 126(2)
36. *Indian Spices*, 1991, 28(1,4)
37. *International Journal of Pharmacognosy*, 1991, 29(4)

38. Japanese Journal of Breeding, 1991, 41(3)
39. Journal Mendel, 1992, 9(1)
40. Journal of Agricultural and Food Chemistry, 1991, 39(11)
41. Journal of Applied Zoological Researches, 1991, 2(2)
42. Journal of Essential Oil Research, 1992, 4(1)
43. Journal of Herbs, Spices & Medicinal Plants, 1992, 1(1&2)
44. Journal of Indian Chemical Society, 1991, 68(7,9)
45. Journal of Japanese Botany, 1991, 66(4)
46. Journal of Natural Products, 1992, 55(1,2)
47. Journal of Research and Education in Indian Medicine, 1991, 10(3,4)
48. Journal of Research in Ayurveda and Siddha, 1991, 12(3-4)
49. Journal of the Indian Chemical Society, 1991, 68(7,8,9,11,12)
50. Journal of the Science of Food and Agriculture, 1992, 58(1)
51. Korean Journal of Pharmacognosy, 1991, 22(3)
52. Lawrence Review of Natural Products, 1991, October, November, 1992, February, March
53. Medicine and Surgery, 1991, 30(1&2)
54. Natural Product Reports, 1991, 8(6)
55. Nippon Kagaku Kaishi, 1991, No.3
56. Nippon Nogeikagaku Kaishi, 1990, 64(9)
57. Oriental Journal of Chemistry, 1991, 7(4)
58. Pakistan Journal of Botany, 1991, 23(1,2)
59. Perfumer & Flavorist, 1992, 17(2)
60. Phytochemistry, 1992, 31(3,4)
61. Phytotherapy Research, 1992, 6(2)
62. Plant Cell Physiology, 1990, 31(3,4)
63. Plant Physiology, 1992, 98(1)
64. Plant Science, 1992, 75(1)
65. Planta Medica, 1992, 58(1,2)
66. Proceeding Indian National Science Academy, 1992, B58(1)
67. Research and Industry, 1992, 37(2)
68. Revista Latinoamericana de Quimica, 1992, 22(4)+23(1)
69. Shoyakugaku Zasshi, 1991, 45(4)
70. South Indian Horticulture, 1991, 39(4,5,6)
71. Tetrahedron Letters, 1992, 33(9,12,14)
72. Tropical Agriculture (Trinidad), 1992, 69(2)
73. Yakugaku Zasshi, 1990, 110(11,12); 1991, 111(1)
74. Zimbabwe Science News, 1991, 25(7/9)
75. Zingiberaceae Workshop, Prince of Songkla University Hat Yai, Thailand, 15-18 Oct., 1991

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 ABRUS PRECATORIUS 2243
 ACACIA FARNESIANA 2726
 ACACIA LEUCOPHLOEA 2611
 ACANTHACEAE 2191 2299 2322 2533
 ACANTHOPanax CHISANENSIS 2726
 ACER CISSIFOLIUM 2529
 ACERACEAE 2529
 ACHILLEA GRANDIFOLIA 2455
 ACHILLEA MILLEFOLIUM 2334
 ACONITUM CHARMICHAELI 2160
 ACONITUM NAPELLUS 2692
 ACONITUM SPP 2553
 ACORUS CALAMUS 2256 2509

ACTINIDACEAE 2534
 ACTINIDIA CHINENSIS 2534
 ADELOSTEMMA GRACILLIMUM 2532
 AEGLE CITRUS 2660
 AEGLE MARMELOS 2475
 AERVA LANATA 2166 2645
 AESCULUS HIPPOCASTANUM 2694 2747
 AFRAEGLASSO 2442
 AGAVACEAE 2169
 AGAVE AMERICANA 2169 2735
 AGAVE AMERICANA VARMARGINATA 2169
 AGAVE ANGUSTIFOLIA 2512
 AGAVE SISALANA 2169
 AGERATUM CONYZOIDES 2354 2683
 AGLAIA PYRAMIDATA 2411
 AGRIMONIA PILOSA 2333
 ALANGIACEAE 2473
 ALANGIUM PLATANIFOLIUM VAR TRILOBUM 2473
 ALBIZZIA JULIBRISIN 2140
 ALBIZZIA LEBBEK 2263
 ALLAMANDA DONIANA 2346
 ALLIACEAE 2287 2293 2610
 ALLIUM CEPA 2610 2704 2727
 ALLIUM FISTULOSUM 2426
 ALLIUM SATIVUM 2287 2293 2721
 ALLIUM SCHUBERTII 2691
 ALLIUM SPP 2361
 ALLIUM URSINUM 2293
 ALOE ARBORESCENS 2291
 ALOE BARBADENSIS 2224
 ALOE MICRONDONTA 2688
 ALOE SPP 2658
 ALPINIA CALCARATA 2097
 ALPINIA CONCHIGERA 2679
 ALPINIA GALANGA 2284 2394 2401 2678
 ALPINIA HENRYI X POLYANTHA 2119
 ALPINIA KATSUMADA 2119
 ALPINIA SPP 2179 2659
 ALPINIA ZERUMBET CV YUHUA 2119
 ALSTONIA PITTIERI 2531
 ALSTONIA SCHOLARIS 2185 2515
 ALSTONIA UNDULIFOLIA 2519
 ALTERNARIA SOLANI 2123
 AMARANTHACEAE 2123 2166 2495 2642 2645
 AMARANTHUS HYPOCHONDRIACUS 2495
 AMARANTHUS SPINOSUS 2123
 AMARYLLIDACEAE 2077 2188 2220 2295 2391 2392
 2434 2512 2735
 AMMI VISNAGA 2108 2109
 AMOMUM 2103
 AMOMUM HONGSAOKO 2433
 AMOMUM PANDANICARPUM 2095

AMOMUM PTEROCARPUM 2097
 AMOMUM SPP 2179
 AMOMUM TSAO-KO 2433
 AMOMUM VILOSUM 2119
 ANACARDIACEAE 2279 2500 2545
 ANAGALLIS ARVENSIS 2380
 ANDROGRAPHIS PANICULATA 2191 2299 2322
 ANETHUM GRAVEOLENS 2135 2136
 ANGELICA ACUTILOBA 2318
 ANGELICA ARCHANGELICA 2226
 ANGELICA KOREANA 2498
 ANGELICA SINENSIS 2257 2269
 ANGOLENSIS 2543
 ANIBA MUCA 2654
 ANNONA RETICULATA 2316
 ANNONA SQUAMOSA 2349
 ANNONACEAE 2316 2321 2326 2349 2400 2459 2499
 2602
 ANTIDESMA TETRANDA 2383
 ANTIDESMA TOMENTOSA 2362
 ANTIRRHINUM MAJUS 2128
 APIACEAE 2226 2345 2500
 APIUM LEPTOPHYLLUM 2530
 APOCYNACEAE 2067 2133 2150 2151 2163 2175 2185
 2198 2222 2233 2239 2256 2320 2326 2346
 2350 2409 2445 2480 2502 2519 2523 2531
 2684 2696
 ARACEAE 2256 2509 2612
 ARALEACEAE 2164 2318 2462 2582 2588 2635 2649
 2726
 ARALEOPSIS TABOUENSIS 2442
 ARDISIA CRENATA 2622
 ARGEMONE SPP 2361
 ARISTOLOCHIA ELEGANS 2354
 ARISTOLOCHIA TAGALA 2354
 ARISTOLOCHIA VERSICOLAR 2646
 ARISTOLOCHIACEAE 2354 2646
 ARNEBIA EUCHROMA 2636 2637 2638
 ARNICA MONTANA 2130 2692
 AROMADENDRON ELEGANS 2477
 ARTEMISIA ABSINTHIUM 2500
 ARTEMISIA ANNUA 2101 2158 2517 2653
 ARTEMISIA CARNIFOLIA 2555
 ARTEMISIA DRACUNCULUS 2728
 ARTEMISIA PARVIFLORA 2330
 ARTEMISIA PERSICA 2625
 ARTEMISIA SPP 2381
 ARTEMISIA VESTITA 2341
 ARTEMISIA VULGARIS 2254
 ARTHROCNEMUM GLAUCUM 2487
 ASCLEPIADACEAE 2084 2233 2286 2295 2353 2365
 2406 2420 2421 2532 2566 2643
 ASCLEPIAS CURASSAVICA 2233 2365
 ASIMINA TRILOBA 2321
 ASPARAGUS OFFICINALIS 2129
 ASPARAGUS RACEMOSUS 2509 2584 2734
 ASTERACEAE 2101 2117 2130 2158 2381 2437 2455
 2500 2555 2565 2597 2600 2653
 ASTERELLA ANGUSTA 2550
 ASTRAGALUS MEMBRANACEUS 2318
 ASTRAGALUS MONGHOLICUS 2137 2297
 ATRACTYLOIDES LANCEAE 2318
 ATROPA BELLADONNA 2141
 AURANTIOIDEAE 2090
 AVERrhoa BILIMBI 2454
 AVERrhoa CARAMBOLA 2454
 AZADIRACHTA INDICA 2184 2348 2583

BALSAMINACEAE 2232
 BAPTISIA TINCTORIA 2215
 BAROSMA CRENULATA 2627
 BARRINGTONIA ASIATICA 2320
 BERBERIDACEAE 2162 2186 2256 2328 2409 2585
 BERBERIS 2409
 BERBERIS ARISTATA 2186 2585
 BERBERIS ASIATICA 2256
 BERBERIS CHITRIA 2328
 BIGNONIACEAE 2214
 BIXA ORELLANA 2306 2359
 BIXACEAE 2306 2359
 BLUMEA BALSAMIFERA 2124 2354
 BOLBOSTEMMA PANICULATUM 2260
 BORAGINACEAE 2124 2153 2233 2374 2385 2485 2618
 2636 2637 2638
 BOSENBERGIA 2103
 BOSENBERGIA SPP 2102
 BOSWELLIA CARTERII 2171
 BOSWELLIA SERRATA 2171 2726
 BRACHIARIA DECUMBENS 2244
 BRASSICA ALBA 2715 2741
 BRASSICA HIRTA 2741
 BRASSICA JUNCEA 2715 2741
 BRASSICA NAPUS 2245
 BRASSICA NIGRA 2715 2741
 BRASSICA SPP 2708 2709
 BRUCEA JAVANICA 2268
 BRYONIA DIOICA 2546
 BUCHENAVIA CAPITATA 2325
 BUDDLEJA JAPONICA 2528 2633
 BUDDLEJACEAE 2528 2633
 BULNESIA SARMIENTOI 2359
 BUPLEURUM FALCATUM 2098 2345
 BURSERACEAE 2171 2177 2292 2327 2412 2726
 BUXACEAE 2408 2409
 BUXUS HELDERBRANDII 2409
 BUXUS LONGIFOLIA 2409
 BYRSONIMA CRASSIFOLIA 2403
 CAESALPINEA BONDUCELLA 2185
 CAESALPINIA PULCHERRIMA 2354
 CALAMINTHA GRANDIFLORA 2587
 CALOPHYLLUM INOPHYLLUM 2347
 CALOPHYLLUM SPP 2358
 CALOTROPIS GIGANTEA 2353
 CALOTROPIS PROCERA 2233 2509
 CAMMELINACEAE 2697
 CANBRALEA 2702
 CANSORA DECUSSATA 2220
 CAPPARIDACEAE 2572
 CAPPARIS SEPIARIA 2572
 CAPRIFOLIACEAE 2072 2465
 CAPSELLA BURSA-PASTORIS 2324
 CAPSICUM ANNUUM 2340
 CAPSICUM ANNUUM VAR. CONOIDES 2632
 CAPSICUM ANNUUM VAR. FASCICULATUM 2632
 CAPSICUM SPP 2225 2687
 CAREX SPP 2112
 CARICA PAPAYA 2288
 CARICACEAE 2288
 CARMONA RETUSA 2124 2618
 CARTHAMUS TINCTORIUS 2236
 CARUM FRUCTUS 2452
 CARYOPHYLLACEAE 2388 2648 2716
 CASSIA ALATA 2355
 CASSIA GARRETTIANA 2231
 CASSIA OBTUSIFOLIA 2580

CASSIA SPP 2665
 CASSIA TOROSA 2240
 CASSIPOUREA GARRARDII 2431
 CASSUS DIGITATA 2377
 CASTANOSPERMUM AUSTRALE 2374
 CATHARANTHUS ROSEUS 2067 2133 2150 2151 2163
 2409 2445 2696
 CAUTLEYA 2100
 CAUTLEYA PETIOLATA 2091
 CELASTRACEAE 2205 2379 2390 2405 2450 2451 2560
 2595 2601
 CELASTRUS ROSTHORNIANUS 2560 2601
 CENTAUREA SONCHIFOLIA 2252
 CENTIPEDA MINIMA 2314
 CERATIOLA ERICOIDES 2482
 CHAMOMILLA RECUTITA 2117
 CHAUNOCHITON KAPPLERI 2216
 CHENOPODIACEAE 2487 2665
 CHROMOLAENA ODORATA 2354
 CHRYSANTHEMUM INDICUM 2193 2354
 CHRYSANTHEMUM MORIFOLIUM 2306
 CINCHONA LEDGERIANA 2126 2239
 CINCHONA SPP 2723
 CINNAMOMUM CAMPHORA 2336
 CINNAMOMUM CASSIA 2318
 CISSUS QUADRANGULARIS 2676
 CITRUS 2092
 CITRUS AURANTIFOLIA 2090
 CITRUS GRANDIS BUNTAN 2444
 CITRUS HASSAKU 2520
 CITRUS MADURENISIS 2090
 CITRUS NATSUDAIDAI 2360 2444
 CITRUS SPP 2444 2470 2698
 CLAUSENA ANISATA 2442
 CLINOPodium POLYCEPHALUM 2630
 CLINOPodium UMBROSUM 2578
 CLITORIA TERNATEA 2670
 CNIDIUM MONNIERI 2386
 CNIDIUM OFFICINALE 2318
 CNIDOSCULUS URENS 2329
 COCCULUS HIRSUTUS 2372
 COCCULUS PENDULUS 2409
 COCOS NUCIFERA 2250
 COFFEA KIANJAVATENSIS 2661
 COFFEA LANCIFOLIA 2661
 COLCHICUM AUTUMNALE 2447
 COLEUS AMBOINICUS 2354 2731
 COLEUS AROMATICUS 2202
 COLUEUS BLUMEI 2335
 COMBRETACEAE 2181 2287 2325 2410
 COMMIPHORA ERYTHRaea 2177
 COMMIPHORA GUIDOTTII 2177 2327
 COMMIPHORA MUKUL 2292 2726

 COMPOSITAE 2068 2075 2124 2155 2170 2193 2215
 2230 2233 2236 2252 2254 2277 2295 2306
 2314 2318 2323 2330 2334 2341 2354 2355
 2385 2388 2389 2402 2438 2476 2479 2492 2501
 2508 2517 2536 2554 2556 2561 2574 2579
 2599 2625 2626 2683 2692 2710 2712 2726
 2728
 CONVOLVULACEAE 2281 2282 2306 2349 2351 2544
 CONVULLARIA MAJALIS 2575
 CONYZA LINIFOLIA 2437
 CONYZA PINNATA 2554
 CORIANDRUM SATIVUM 2110 2111 2120 2121 2225
 CORYDALIS STEWARTII 2464

COSCINIUM FENESTRATUM 2557
 COSTUS 2086 2103 2674
 COSTUS SPECIOSUS 2735
 COSTUS SPP 2094
 CROTALARIA PROSTRATA 2631
 CROTALARIA SEMPERFLORENS 2422
 CROTON MACROSTACHYUS 2367
 CRUCIFERAEE 2245 2324 2488 2708 2709 2715 2741
 CRYPTOCARYA DENSIFLORA 2366
 CRYPTOSTEGIA GRANDIFLORA 2233
 CUCURBITACEAE 2184 2253 2260 2288 2371 2415
 2546 2576
 CUPRESSACEAE 2494
 CUPRESSUS FUNEBRIS 2494
 CURCULIGO ORCHIOIDES 2295 2629
 CURCUMA 2103
 CURCUMA AMADA 2675
 CURCUMA ANGUSTIFOLIA 2675
 CURCUMA AROMATICA 2675
 CURCUMA AURANTIACA 2657
 CURCUMA DOMESTICA 2657 2728
 CURCUMA LONGA 2064 2184 2195 2254 2284 2340
 2354 2675 2678 2700 2726 2728 2739
 CURCUMA MANGGA 2657
 CURCUMA NEILGHERRENSIS 2675
 CURCUMA PSEUDOMONTANA 2675
 CURCUMA SPP 2659
 CURCUMA XANTHORHIZA 2657
 CURCUMA ZEDOARIA 2286 2657 2675
 CYCLEA BARBATA 2411
 CYMBOPOGON CITRATUS 2598
 CYMBOPOGON TRAVANCORENSIS 2514
 CYNANCHUM FORMOSANUM 2406
 CYNODON DACTYLON 2300
 CYNOGLOSSUM RETICULATUM 2385
 CYNOGLOSSUM MACROSTYLOM 2485
 CYPERACEAE 2112
 CYPERUS 2112
 CYPHANTHERA ALBICANS 2656
 CYPRESS SPP(PATENT) 2750
 DACRYODES BUETTNERI 2412
 DACRYODES IGAGANGA 2412
 DALBERGIA NIGRA 2213
 DAPHNE GENKWA 2167
 DATURA SPP 2361
 DATURA STRAMONIUM 2149
 DATURA TATULA 2141
 DAUCUS CAROTA 2243
 DECAISNEA FARGESII 2634
 DELPHINIUM CARDIOPETALUM 2564
 DELPHINIUM PEREGRINUM 2608
 DELPHINIUM SPP 2553
 DERRIS ELLIPTICA 2354
 DERRIS LAXIFLORA 2504
 DERRIS PHILIPPINENSIS 2354
 DESMODIUM ADSCENDENS 2368
 DESMOS LONGIFLORA 2459
 DESMOTACHYIA BIPINNATA 2300
 DICRANOSTIGMA LACTUCOIDES 2430
 DIGITALIS CILIATA 2486
 DIGITALIS LANATA 2142 2751
 DIGITALIS SUBALPINA 2503
 DIMEROCOSTUS 2086
 DIOSCOREA ALATA 2127
 DIOSCOREA BULBIFERA 2127
 DIOSCOREA DELTOIDEA 2735
 DIOSCOREA ESCULENTA 2127
 DIOSCOREA FLORIBUNDA 2127
 DIOSCOREA HISPIDA 2355
 DIOSCOREA ROTUNDATA 2127
 DIOSCOREA SPP 2722
 DIOSCOREA VILLOSA 2692
 DIOSCOREACEAE 2127 2355 2692 2722 2735
 DIPSACACEAE 2511
 DIPSACEAE 2647
 DIPSACUS ASPER 2647
 DIZABALACEAE 2621
 DODONAEA VISCOSA 2489
 DROsera PELTATA 2174
 DROsera SPP 2203
 DROSERACEAE 2174 2203
 DUBOISIA HOPWOODII 2656
 DUBOISIA LEICHHARDTII 2141
 DUBOISIA MYOPOROIDES 2656
 DUTAILLYEA BAUDOUINII 2535
 ECHINACEA PURPUREA 2215
 ECHINOPS ECHINATUS 2402
 ELAEAGNACEAE 2742
 2065
 ELETTARIA CARDAMOMUM 2340 2678
 ELETTARIOPSIS CURTISII 2088
 ELETTARIOPSIS SMITHIAE VAR RUGOSA 2088
 ELETTARIOPSIS TRILOBA 2088
 ELTINGERA SPP 2094
 EMBELIA RIBES 2256
 EMBLICA OFFICINALIS 2739
 EMBLICA RIBES 2243
 EMPETRACEAE 2482
 ENTADA PHASEOLOIDES 2619
 EPHEDRA SINICA 2238
 EPHEDRA SPP 2413
 EPHEDRACEAE 2238 2413
 EPIGYNUM AURITUM 2480
 EPIMEDIUM DIPHYLLUM 2162
 EPIMEDIUM PUBESEENS 2518
 EPIMEDIUM WUSHANENSE 2518
 ERICACEAE 2308
 ERIGERON LINIFOLIUS 2341
 ERIODICTYON CALIFORNICUM 2251
 ESCHSCHOLTZIA CALIFORNICA 2134
 EUCALYPTUS NOVA-ANGLICA 2398
 EUCALYPTUS 2298
 EUCALYPTUS CITRIODORA 2690
 EUCALYPTUS PERRINIANA 2148
 EUCALYPTUS SPP 2361
 EUCALYPTUS TERETICORNIS 2416
 EUONYMUS SPP 2390
 EUPATORIUM TRILINERVE 2710
 EUPHORBIA KANSUI 2423
 EUPHORBIA NIVULIA 2573
 EUPHORBIACEAE 2145 2168 2190 2326 2329 2338
 2362 2367 2369 2383 2415 2423 2545 2571
 2573 2593 2713 2739
 EUPOMATIA BENNETTII 2592
 EUPOMATIA LAURINA 2592
 EUPOMATIACEAE 2592
 EURYA JAPONICA 2099
 EURYCOMA LONGIFOLIA 2249
 EVODIA OFFICINALIS 2182
 FABACEAE 2590 2616 2665
 FAGARA ZANTHOXYLOIDES 2201
 FAGAROPSIS GLABRA 2651
 FAGOPYRUM ESCULENTUM 2143 2144
 FERULA COMMUNIS VAR GENUINA 2247

FIMBRISTYLIS BISUMBELLATA 2112
 FIMBRISTYLIS DICHOTOMA 2112
 FIMBRISTYLIS FALCATA 2112
 FIMBRISTYLIS FERRUGINEA 2112
 FIMBRISTYLIS MILLIACEA 2112
 FIMBRISTYLIS MONOSTACHYA 2112
 FIMBRISTYLIS POLYTRICHOIDES 2112
 FIMBRISTYLIS QUINQUANGULARIS 2112
 FIMBRISTYLIS TENERA 2112
 FOENICULUM VULGARE 2500
 FORSYTHIA SUSPENSA 2541
 FORTUNELLA MARGARITA 2090
 FORTUNELLA POLYANDRA 2090
 FRITILLARIA HUPEHENSIS 2628
 FUMARIACEAE 2464
 FURCRAEA SELLOA 2169
 GARCINIA CAMBOGIA 2178
 GARCINIA OPACA 2448
 GARRYA SPP 2553
 GARRYACEAE 2553
 GENTIANA ASCLEPIADEA 2493
 GENTIANA MANSHURICA 2711
 GENTIANA SEPTEMFIDA 2399
 GENTIANA URNULA 2634
 GENTIANACEAE 2185 2220 2399 2493 2634 2711
 GERANIACEAE 2500
 GINKGO BILOBA 2087 2460 2518
 GINKGOACEAE 2087 2460 2518
 GLAUCIUM ARABICUM 2192
 GLIRICIDIA SEPIUM 2354 2545
 GLOBBA 2100
 GLOBBA MARANTINA 2097
 GLYCINE MAX 2497
 GLYCINE MAX(PATENT) 2755
 GLYCOSMIS LIMONIA 2660
 GLYCYRRHIZA 2304
 GLYCYRRHIZA GLABRA 2295 2734
 GLYCYRRHIZA URALENSIS 2246 2318 2505
 GOMPHRENA OFFICINALIS 2642
 GRAMINEAE 2193 2244 2288 2300 2598 2639
 GROSSULARIACEAE 2596
 GUAIANCUM OFFICINALE 2374
 GUAREA GUIDONA 2276
 GUIBOURRIA EHIE 2266
 GUTTIFERAE 2178 2230 2347 2358 2448 2692
 GYMNEMA CURRENTIACUM 2295
 GYMNEMA SYLVESTRE 2286
 GYNOSTEMMA PEDATUM 2415
 GYNOSTEMMA PENTAPHYLLA 2253
 HAPLOPHYLLUM SPP 2577
 HAPLOPHYLLUM TUBERCULATUM 2378
 HARPAGOPHYTUM PROCUMBENS 2248
 HEDYCHIUM 2100 2103
 HEDYCHIUM ACUMINATUM 2675
 HEDYCHIUM GRACILE 2675
 HEDYCHIUM PHILIPPINENSE 2095 2115
 HEDYCHIUM SPICATUM 2675
 HEDYCHIUM SPP 2102
 HEDYOTIS INTRICATA 2428
 HELIOTROPIUM ARBAINENSE 2385
 HELIOTROPIUM ROTUNDIFOLIUM 2385
 HELIOTROPIUM SPP 2233
 HEMIDESMUS INDICUS 2420 2421
 HEMIGRAPHIS HIRTA 2533
 HIBISCUS ESCULENTUS 2255
 HIBISCUS SABDARIFFA 2261
 HIMATHANTHUS OBOVATUS 2346

HIPPOCASTANACCEAE 2747
 HIPPOPHAE RHAMNOIDES 2065 2742
 HOLARRHENA ANTIDYSENTERICA 2175 2256
 HOLOCALYX GLAZIOVII 2456
 HOMALOMENA AROMATICA 2612
 HORNSTEDTIA 2103
 HYDRANGEA MACROPHYLLA VAR THUNBERGII 2239
 HYDROPHYLLACEAE 2251
 HYDROXYACETEOSIDE 2541
 HYOSCYAMUS ALBUS 2153
 HYOSCYAMUS MUTICUS 2116
 HYOSCYAMUS NIGER 2141
 HYPERICUM PERFORATUM 2692
 HYPERICUM SPP 2230
 HYPOXIDACEAE 2629
 HYPTIS MUTABILIS 2200
 HYPTIS SUAVEOLENS 2551
 IBOZA RIPARIA 2683
 ILLICIACEAE 2496
 ILLICIUM DUNNIANUM 2496
 ILLICIUM VERUM 2728
 IMPATIENS BALSAMINA 2232
 IMPERATA CYLINDRICA 2193
 IPOMOEA BATATAS 2306
 IPOMOEA CARNEA 2349
 IPOMOEA FISTULOSA 2351
 IPOMOEA OPERCULATA 2544
 IPOMOEA PES-CAPRAE 2281 2282
 IRIDACEAE 2581
 IRIS CROCEA 2581
 ISOTOMA LONGIFOLORA 2362
 IXORA COCCINEA 2275
 JATROPHA MOLLISSIMA 2571
 JATROPHA MULTIFIDA 2338
 JUSSIAEA REPENS 2533
 KADSURA LONGIPEDUNCULATA 2172
 KADSURA SPP 2506
 KAEMPFERIA 2103
 KAEMPFERIA ANGUSTIFOLIA 2604 2605
 KAEMPFERIA GALANGA 2394 2604 2662 2678
 KAEMPFERIA PARVIFLORA 2604 2605
 KAEMPFERIA ROTUNDA 2604
 KAEMPFERIA SPP 2102
 KARWINSKIA PARVIFOLIA 2620
 KITAIBELIA VITIFOLIA 2522
 KUNZEA ERICOIDES 2395
 KUNZEA SINCLAIRII 2395
 LABIATAE 2066 2070 2079 2080 2085 2147 2154
 2161 2200 2202 2210 2235 2270 2301 2303 2319
 2335 2341 2344 2354 2361 2362 2375 2384
 2411 2424 2425 2427 2440 2458 2469 2490
 2547 2551 2552 2559 2578 2587 2589 2630
 2655 2663 2683 2702 2703 2710 2718 2721
 2727 2728 2731
 LACTUCA SATIVA VAR CAPITATA 2712
 LACTUCA VIROSA 2712
 LAGERSTROEMIA SPECIOSA 2312
 LAMIACEAE 2223 2339 2714
 LARDIZAHALACEAE 2634
 LASER TRILOBUM 2376
 LASERPITIUM TRILOBUM 2376
 LATHYRUS SATIVUS 2131 2665
 LAURACEAE 2071 2318 2336 2363 2366 2382 2418
 2549 2617 2654
 LAVANDULA LATIFOLIA 2154
 LAVANDULA OFFICINALIS 2154

LAVANDULA SPICA 2552
 LAWSONIA ALBA 2196
 LAWSONIA INERMIS 2724
 LEGUMINOSAE 2122 2131 2140 2156 2185 2215 2231
 2233 2240 2243 2246 2263 2264 2266 2295
 2297 2304 2311 2318 2354 2368 2374 2404
 2409 2414 2422 2429 2456 2457 2468 2497
 2504 2505 2513 2545 2563 2567 2569 2580 2591
 2614 2619 2631 2650 2665 2670 2685 2726 2734
 2735

LEGUMINOSAE(PATENT) 2755 2756
 LEPIDOPHYLLUM QUADRANGULARE 2508
 LEPTOSALENA 2095
 LEPTOSPERMUM SPP 2652
 LEUCAENA GLAUCA 2414
 LEVISTICUM OFFICINALE 2069
 LIGUSTICUM WALLICHII 2269
 LIGUSTRUM PURPURASCANS 2634

LILIACEAE 2129 2224 2267 2285 2291 2361 2426
 2435 2447 2483 2509 2575 2584 2628 2634 2658
 2688 2691 2704 2721 2727 2734

LILUM CANDIDUM 2435
 LINACEAE 2606
 LINARIA VULGARIS 2467
 LINDERA BENZOIN 2382
 LINUM FLAVUM 2606
 LIPPIA DULCIS 2153
 LITHOSPERMUM ERYTHRORHIZON 2153
 LITSEA AMARA 2366
 LITSEA ZEYLANICA 2549
 LOGANIACEAE 2283 2307 2363 2526
 LONICERA MORROWII 2465
 LOPHIRA ALATA 2594
 LORANTHACEAE 2326
 LOTONONIS 2616
 LUFFA ECHINATA 2371
 LUPINUS ANGUSTIFOLIUS 2404
 LYCHNIS FULGENS 2388
 LYCOPUS EUROPAEUS 2223
 LYCOPUS LUCIDUS 2425 2427
 LYTHRACEAE 2196 2312 2724

MACARANGA VEDELIANA 2593
 MACROPHYLLA 2515
 MADHUCA BUTYRACEA 2634
 MAGNOLIA GRANDIFLORA 2719
 MAGNOLIA MACROPHYLLA 2719
 MAGNOLIA OBOVATA 2239
 MAGNOLIA OFFICINALIS 2387
 MAGNOLIA SALICIFOLIA 2309
 MAGNOLIACEAE 2239 2326 2387 2477 2607 2719
 2728

MAJORANA HORTENSIS 2710
 MALPIGHIACEAE 2403
 MALVA VERTICILLATA 2296
 MALVACEAE 2218 2255 2261 2296 2326 2409 2522
 MANIHOT ESCULENTA 2545
 MARGARITARIA INDICA 2383
 MARJORANA HORTENSIS 2147
 MARSDENIA KOI 2566 2643
 MARTYNIA ANNUA 2453
 MARTYNIACEAE 2453
 MASCAROCOFFEA 2661
 MATRICARIA CHAMOMILLA 2155
 MATRICARIA PERFORATA 2068

MAYTENUS BOARIA 2451
 MAYTENUS DISTICHA 2379
 MEDODORUM FRUTICOSUM 2602
 MELALEUCA ALTERNIFOLIA 2481
 MELALEUCA LEUCADENDRON 2310
 MELIA 2702
 MELIA TOSENDAN 2537
 MELIACEAE 2184 2276 2348 2363 2393 2411 2537
 2583 2664 2702

MELICOPE TRIPHylla 2461
 MELOCHIA CORCHORIFOLIA 2234
 MELODINUS SCANDENS 2523
 MENISPERMACEAE 2184 2239 2313 2355 2372 2409
 2411 2419 2548 2557

MENTHA ARvensis 2344 2655 2663
 MENTHA ARvensis VAR PIPERASCENS 2070
 MENTHA LONGIFOLIA 2655
 MENTHA SPICATA 2655
 MICHELIA ALBA 2607
 MICROMERIA MYRTIFOLIA 2547
 MIKANIA CORDATA 2323 2355
 MILLETIA AURICULATA 2614
 MIMOSA PUDICA 2414
 MIMOSACEAE 2611 2673
 MONANTHOTAXIS CAPEA 2499
 MONOCOSTUS 2086
 MORACEAE 2436 2443 2558
 MORINDA CITRIFOLIA 2414
 MORINDA OFFICINALIS 2414
 MORINGA OLEIFERA 2138 2668
 Moringaceae 2138 2668
 MORUS ALBA 2436 2443
 MURRAYA EUCHRESTIFOLIA 2471 2472
 MURRAYA PANICULATA 2409
 MURRAYA RUTA 2660
 MYRISLICACEAE 2542
 MYRISTICA FRAGRANS 2727
 MYRISTICACEAE 2727
 MYRSINACEAE 2243 2256 2622
 MYRTACEAE 2148 2298 2310 2320 2361 2395 2398
 2416 2481 2603 2652 2690 2730

NARCISSUS PALLIDULUS 2392
 NARCISSUS POETICUS 2434
 NARCISSUS VASCONICUS 2391
 NAUCLEA ORIENTALIS 2217
 NEOFABRICIA MJAEBERGII 2652
 NEOFABRICIA MYRTIFOLIA 2652
 NEOFABRICIA SERICISEPALA 2652
 NEOLITSEA CASSIAEFOLIA 2366
 NERIUM INDICUM 2233 2320 2350
 NERIUM OLEANDER 2320
 NICOTIANA GLUTINOSA 2753 2754
 NICOTIANA SPP(PATENT) 2746
 NIGELLA SATIVA 2409
 NYCTANTHES ARBOR-TRISTIS 2615
 OCHNA CALODENDRON 2524
 OCHNACEAE 2524 2594
 OCIMUM BASILICUM 2066 2080 2341 2440
 OCIMUM CANUM 2721
 OCIMUM SANCTUM 2301 2303 2341 2362
 OCIMUM SPP 2361
 OCOTEA CAPARRAPI 2418
 OCOTEA TELEIANDRA 2617
 OLACEAE 2216
 OLEA EUROPAEA 2157
 OLEACEAE 2157 2634
 ONAGRACEAE 2533

ONONIS ARVENSIS	2156	PIPERACEAE	2081	2096	2125	2180	2206	2225	2332
OPHIORRHIZA SPP	2539		2355	2396	2474	2721			
ORBANCHACEAE	2280	PISCIDIA PISCIPULA	2429						
ORCHIDACEAE	2295	PISTACIA LENTISCUS	2500						
ORIGANUM VULGARE	2703	PLECTRANTHUS AMBOINICUS	2683						
OROBANCHE HEDERAEE	2280	PLECTRANTHUS INCANUS	2578						
OSTERICUM KOREANUM	2498	PLUCHEA LANCEOLATA	2726						
OTANTHUS MARITIMUS	2438	PLUMBAGINACEAE	2509						
OXALIDACEAE	2454	PLUMBAGO ZEYLANICA	2509						
OXALIS CORNICULATA	2454	PLUMERIA ACUTIFOLIA	2222						
OXYTROPIS OCHROCEPHALA	2590	POACEAE	2514						
PACHYSANDRA AXILLARIS	2408	POGOSTEMON PATCHOULI	2079						
PAEONIA LACTIFLORA	2241	POLIANTHES TUBEROSA	2077						
PAEONIACEAE	2241	POLYALTHIA LONGIFOLIA	2400						
PALICOUREA RIGIDA	2397	POLYGALA TENUIFOLIA	2466	2527					
PALMAE	2250	POLYGALACEAE	2466	2527					
Panax GINSENG	2164	POLYGONACEAE	2143	2144	2242	2274	2562	2609	
Panax NOTOGINSENG	2649	POLYGONATUM KINGIANUM	2634						
Panax PSEUDO-GINSENG SUBSP HIMALAICUS VAR		POLYGONATUM PRATII	2634						
ANGUSTIF	2582	POLYGONUM AMBHIBIUM	2562						
PANCRATIUM BIFLORUM	2220	POLYGONUM COGNATUM	2609						
PANDANACEAE	2540	POLYGONUM SPP	2274						
PANDANUS AMARYLLIFOLIUS	2540	PONGAMIA PINNATA	2591						
PANICUM REPENS	2639	POPULUS SPP	2227						
PAPAVER BRACTEATUM	2118	PORTULACA OLERACEA	2355						
PAPAVER SOMNIFERUM	2082	PORTULACACEAE	2355						
PAPAVERACEAE	2082	PREMNA NAUSEOSA	2354						
PAPILIONACEAE	2113	PREMNA ODORATA	2354						
PARACAUTLEYA SPP	2091	PREMNA OLIGOTRICHA	2331						
PARAKAEMPFERIA SPP	2091	PRIMULACEAE	2380						
PARASTEPHYA LEPIDOPHYLLUM	2508	PROSOPIS CINERARIA	2673						
PASTINACA SATIVA	2189	PRUNUS SPINOSA	2449						
PEDALIACEAE	2248	PSEUDO-ELEPHANTOPUS SPICATUS	2561						
PELARGONIUM GRAVEOLENS	2500	PSEUDOSTELLARIA HETEROPHYLLA	2648						
PELIOSANTHES DELANAYI	2634	PSORALEA BITUMINOSA	2468	2650					
PENNISETUM PURPUREUM	2288	PSORALEA GLANDULOSA	2468						
PENSTEMON SERRULATUS	2159	PSORALEA MACROSTACHYA	2468						
PEPEROMIA PELLUCIDA	2355	PSORALEA ONOBRYCHIS	2468						
PERILLA FRUTESCENS VAR ACUTA	2235	PTERO-CARPUS SANTALINUS	2311						
PETCHIA CEYLANICA	2409	PUERARIA LOBATA(PATENT)	2756						
PETUNIA PARODII	2439	PULICARIA SPP	2381						
PHELLODENDRON AMURENSE	2491	PULSATILLA CAMPANELLA	2634						
PHYLLANTHUS AMARUS	2168	PULSATILLA NIGRICANS	2692						
PHYLLANTHUS DEBILIS	2168	PYCNANTHUS ANGOLENSIS	2543						
PHYLLANTHUS EMBLICA	2190	QUISQUALIS INDICA	2287						
PHYLLANTHUS NIRURI	2190	RABdosia RUBESCENS	2589						
PHYLLANTHUS URINARIA	2168	RANUNCULACEAE	2160	2318	2409	2510	2553	2564	
PHYLLANTHUS VIRGATUS	2168		2608	2613	2634	2692			
PHYTOLACCA DIOICA	2302	RAUWOLFIA CANESCENS	2198						
PHYTOLACCA DODECANDRA	2074	RAUWOLFIA SERPENTINA	2239						
PHYTOLACCA ESCULENTA	2640	REAUMURIA HIRTELLA	2641						
PHYTOLACCACEAE	2074	REBOUTACEAE	2550						
PICRALIMA NITIDA	2502	REHMANNIA GLUTINOSA PURPURPUREA	2318						
PICRIS HIERACIOIDES SUBSP HIERACIOIDES	2492	RHAMNACEAE	2620						
PICRORRHIZA KURROA	2185	RHAPONTICUM CARTHAMOIDES	2388	2389					
PIMENTA JAMAICENSIS	2603	RHAPONTICUM INTEGRIFOLIUM	2388						
PIMPINELLA SPP	2500	RHAPONTICUM LURATUM	2388						
PINACEAE	2173	RHAPONTICUM NANUM	2388						
PINUS	2194	RHAPONTICUM UNIFLORUS	2170						
PINUS KORAIENSIS	2173	RHEUM PULMATUM	2242						
PIPER BETLE	2096	RHIAZYA STRICTA	2409						
PIPER CLARKII	2396	RHIZOPHORA MUCROMAA	2362						
PIPER LONGUM	2180	RHIZOPHORACEAE	2362	2431					
PIPER METHYSTICUM	2474	RHODODENDRON ARBOREUM	2308						
PIPER NIGRUM	2071	RIBES NIGRUM	2596						
	2081	RICINUS COMMUNIS	2713						
	2125	RICINUS SANGUINES	2713						

RIEDELIALLA GRACILIFLORA 2457
 ROSA RUGOSA 2352
 ROSA SPP 2073
 ROSACEAE 2073 2333 2352 2407 2449 2742
 ROSCOEA 2100
 ROSMARINUS OFFICINALIS 2714
 RUBIA CORDIFOLIA 2221
 RUBIA YUNNANENSIS 2648
 RUBIACEAE 2126 2139 2217 2221 2239 2275 2326
 2397 2414 2428 2539 2648 2661 2723
 RUBUS SUAVISSIMUS 2742
 RUTA MONTANA 2577
 RUTACEAE 2090 2092 2182 2201 2326 2360 2363
 2378 2409 2442 2444 2461 2470 2471 2472
 2475 2491 2520 2535 2577 2627 2651 2660
 2664 2698 2738
 SACCHARUM MUNJA 2300
 SACCHARUM OFFICINALE 2300
 SACCHARUM SPONTANEUM 2300
 SALACIA CORDATA 2595
 SALIACEAE 2484
 SALICACEAE 2227
 SALIX MYRSINIFOLIA 2484
 SALVIA 2702
 SALVIA ALBOCAERULEA 2339
 SALVIA CHINENSIS 2559
 SALVIA GLABRESCENS 2469
 SALVIA JAPONICA 2469
 SALVIA LAVANDULIFOLIA 2270
 SALVIA MICROSTEGIA 2411
 SALVIA MILTIORRHIZA 2375 2384 2458
 SALVIA OFFICINALIS 2424
 SANGUISORBA OFFICINALIS 2407
 SAPINDACEAE 2326 2489 2694
 SAPIUM BACCATUM 2383
 SAPIUM SEBIFERUM 2145
 SAPOTACEAE 2634
 SATUREJA HORTENSIS 2718
 SATUREJA MONTANA 2718
 SAXIFRAGACEAE 2239
 SCHAEFFERIA CUNEIFOLIA 2450
 SCHEFLERA IMPRESSA 2588
 SCHISANDRA FRUCTUS(PATENT) 2752
 SCHISANDRACEAE 2172 2506 2752
 SCIRPUS SPP 2112
 SCLEROGRYNA BIRREA 2279
 SCOPALIA JAPONICA 2239 2141
 SCROPHULARIA NINGPOENSIS 2176
 SCROPHULARIA SPICATA 2634
 SCROPHULARIACEAE 2128 2142 2159 2176 2185 2186
 2317 2318 2463 2467 2486 2503 2509 2623
 2624 2634 2751
 SCUTELLARIA 2304
 SCUTELLARIA PROSTRATA 2490
 SCUTELLARIAE BAICALENSIS 2210
 SECHIUM EDULE 2288
 SELSOLA SOMALENSIS 2665
 SENECIO ADONIDIFOLIUS 2626
 SENECIO ANONYMUS 2385
 SENRA INCANA 2218
 SERIPHIDIUM BREVIFOLIUM 2579
 SESAMUM INDICUM 2728
 SHUTERIA VESTITA 2563
 SIDA OVATA 2409
 SIDA PAKISTANICA 2409
 SIEGESBECKIA PUBESCENS 2479

SILENE NUTANS 2388
 SILENE TATARICA 2388
 SILER TRILOBIUM 2376
 SIBYBUM MARIANUM 2075
 SIMAROUBACEAE 2249 2268 2664
 SIMSIA FACTIDA 2556
 SINAPSIS JUNCEA 2715
 SIPHOLOSTEGIA CHINENSIS 2634
 SISYMBRIUM IRIO 2488
 SMILAX MENISPERMOIDEA 2483
 SMILAX REGELII 2285
 SOLANACEAE 2083 2107 2114 2116 2141 2149 2153
 2184 2187 2206 2220 2225 2239 2340 2356
 2361 2409 2439 2509 2632 2656 2687 2689
 2734 2735 2737 2753 2754
 SOLANACEAE(PATENT) 2746
 SOLANUM ACULEASTRUM 2356
 SOLANUM BULBOCASTANUM 2107
 SOLANUM INCANUM VAR UNGUICULATUM 2083
 SOLANUM INDICUM 2184
 SOLANUM KHASIANUM 2735
 SOLANUM NIGRUM 2107
 SOLANUM PERUVIANUM 2107
 SOLANUM PHOTEINOCARPUM 2107
 SOLANUM SPP 2361
 SOLANUM XANTHOCARPUM 2187
 SOLIDAGO CANADENSIS 2565
 SONNERATIA APETALA 2446
 SONNERATIACEAE 2446
 SOPHORA EXIGUA 2567
 SOPHORA GRIFFITHII 2409
 SOPHORA SUBPROSTRATA 2569
 SPHAERANTHUS INDICUS 2295
 SPONDIAS MOMBIN 2545
 STACHYS SIEBOLDII 2319
 STACHYTARPHETA JAMAICENSIS 2265
 STANDTIA KAMERUNENSIS 2542
 STAUNTONIA CHINENSIS 2621
 STELLARIA MEDIA 2716
 STEMOIDA MARITIMA 2463
 STEPHANIA CEPHARANTHA 2239 2419
 STEPHANIA ERECTA 2411
 STERCULIA FOETIDA 2432
 STERCULIA TRAGACANTHA 2717
 STERCULIA URENS 2717
 STERCULIA VILLOSA 2717
 STERCIULACEAE 2234 2364 2432 2717
 STERNBERGIA CLUSIANA 2188
 STIZOPHYLLUM RIPARIUM 2214
 STREBLUS ASPER 2558
 STROPHANTHUS KOMBE 2175
 STROPHANTHUS WIGHTIANUS 2175
 STRYCHNOS LIGUSTRINA 2526
 STRYCHNOS TRINERVIS 2307
 STRYCHNOS USAMBARENSIS 2283
 STYPANDRA IMRICATA 2685
 STYRACACEAE 2171
 STYRAX BENZOIN 2171
 STYRAX TONKINENSIS 2171
 SWAINSONA CANESCENS 2685
 SWERTIA CHIRATA 2185 2220
 SWIETENIA MACROPHYLLA 2347
 SYMPHYTUM OFFICINALIS 2374
 SYZYGIUM AROMATICUM 2730
 TABERNAEMONTANA DIVARICATA 2233
 TABERNAEMONTANA PANDACAQUI 2684
 TAGETES ERECTA 2599

TAGETES PATULA	2600
TAGETES SPP	2230
TAMARICACEAE	2641
TAMARIX PAKISTANICA	2641
TAPINOCHEILOS	2086
TAVEHIERA ABYSSINICA	2266
TAXACEAE	2478 2693
TAXUS BREVIFOLIA	2693
TAXUS CHINENSIS	2478
TECLEA GRANDIFOLIA	2442
TERMINALIA ARJUNA	2181
TERMINALIA BRASSII	2410
TERMINALIA COMPLANATA	2410
TERMINALIA IMPEDIENS	2410
TETRAPLEURA TETRAPTERA	2266 2513
THALICTRUM FLAVUM	2613
THALICTRUM GLANDULOSISSIMUM	2510
THEACEAE	2099
THEOBROMA CACAO	2364
THUJA OCCIDENTALIS	2215
THYMELAEACEAE	2167
THYMUS VULGARIS	2161 2728
TILIACEAE	2363
TINOSPORA CORDIFOLIA	2184 2313
TINOSPORA CRISPA	2548
TINOSPORA RHUMPHII	2355
TITHONIA DIVERSIFOLIA	2354
TONDUZIA PITTIERI	2531
TRACHELOSPERMUM JASMINOIDES	2409
TRACHYSPERMUM AMMI	2341
TRADESCANTIA PALUDOSA	2697
TREVIA NUDIFLORA	2415
TRIBULUS TERRESTRIS	2644
TRICHOSANTHES DIOICA	2184
TRIGONELLA FOENUM-GRAECUM	2122 2233 2264 2735
TRIPLOSTEGIA GRANDIFLORA	2511
TRIPTYRYGIUM WILFORDII	2205 2405
TULIPA GESNERIANA	2267
TURRAEA ROBUSTA	2393
TYLOPHORA INDICA	2084
UMBELLIFERAEE	2069 2098 2108 2109 2110 2111 2120
	2121 2135 2136 2189 2225 2243 2247 2257 2269
	2318 2341 2376 2386 2452 2498 2530
UMBELLIFERONE	2507
UNCARIA RHYNCHOPHYLLA	2139
URARIA PICTA	2113
URSINIA SPP	2476
VALERIANA OFFICINALIS	2411
VALERIANACEAE	2411
VANDA SPATULATUM	2295
VANILLA FRAGRANS	2728
VANOVERBERGHIA	2095
VEPRIS LOUISII	2442
VERBASCUM THAPSUS	2623 2624
VERBENACEAE	2078 2124 2146 2153 2204 2265 2331
	2354 2417 2516 2568 2615 2726
VERBESINA ENCELIOIDES	2233
VIBURUM OPULUS	2072
VITACEAE	2377
VITEX AGNUS-CASTUS	2568
VITEX NEGUNDO	2078 2124 2146 2204 2354 2417
	2516 2726
VITEX TRIFOLIA VAR LITTORALIS	2354
VITIDACEAE	2676
WERNERIA DACTYLOPHYLLA	2597
WILBRANDIA EBRACTEATA	2576
WITHANIA COAGULANS	2409
WITHANIA SOMNIFERA	2114 2206 2220 2409 2509
	2734 2737
WITHANIA SOMNIFERA SSP OBTUSIFOLIA	2083
XANTHIUM STRUMARIUM	2574
ZANTHOXYLUM SCHINIFOLIUM	2507
ZINGIBER	2091 2103
ZINGIBER CHRYSANTHUM	2343
ZINGIBER OFFICINALE	2097 2180 2229 2233 2262 2294
	2340 2341 2394 2675 2678 2706 2707 2721
ZINGIBER SPP	2094 2679
ZINGIBERACEAE	2064 2086 2088 2089 2091 2093
	2094 2095 2097 2100 2102 2103 2104 2105
	2106 2115 2119 2179 2180 2184 2195 2229
	2233 2254 2262 2284 2286 2294 2340 2341
	2343 2354 2394 2401 2433 2604 2605 2657 2659
	2662 2674 2675 2677 2678 2679 2700 2706
	2707 2721 2726 2728 2735 2739
ZYGOPHYLLACEAE	2359 2373 2374 2644
ZYGOPHYLLUM PROPINOIUM	2373 2374

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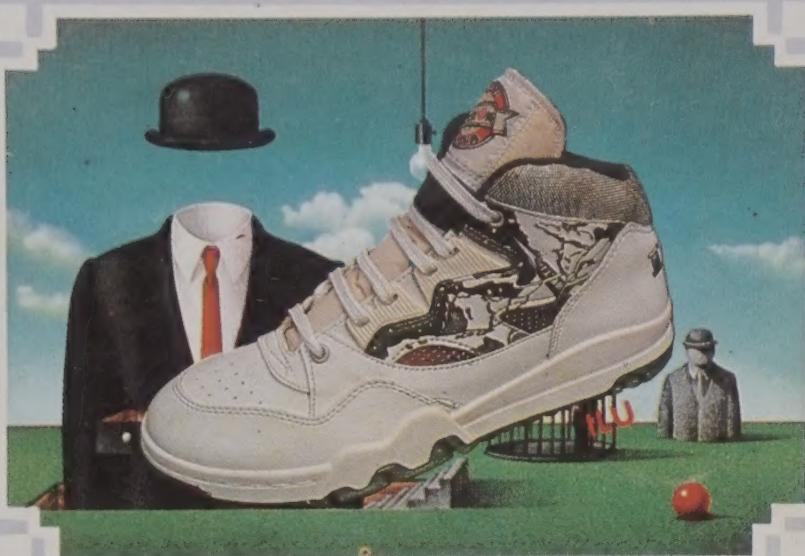
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